

CETIFICATION

SDG No: JC21036 Laboratory: Accutest, New Jersey
 Site: BMS, Building 5 Area, PR Matrix: Soil/Groundwater
 Humacao, PR

SUMMARY: Groundwater and soil samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken May 25, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey for the ABN TCL Special List (1,4-Dioxane and Naphthalene were analyzed following the SIM technique); TCL pesticides list; and for low molecular weight alcohols (LMWA) the results were reported under SDG No.: JC21036. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
JC21036-1	RA7 (4-5)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA
JC21036-1D	RA7 (4-5)MSD	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA
JC21036-1S	RA7 (4-5)MS	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA
JC21036-2	MW-22S (2.7-3.7)	Soil	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA
JC21036-3	RA7-GWD	Groundwater	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA
JC21036-3D	RA7-GWD-MSD	Groundwater	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA
JC21036-3S	RA7-GWD-MS	Groundwater	ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA

Reviewer Name: Rafael Infante
Chemist License 1888

Signature:
Date:

Rafael Infante
June 24, 2016



The image shows a circular professional seal and an orange rectangular stamp. The circular seal has the text "ASOCIADO DE" at the top, "Rafael Infante Méndez" in the center, "LIC. # 1888" below the name, and "QUIMICO LICENCIADO" at the bottom. The orange stamp features a small circular emblem on the left, the text "A 1586459" at the bottom, and a "5100" value in the top right corner.

SGS Accutest

Report of Analysis

Page 1 of 3

Client Sample ID:	RA7 (4-5)	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-1	Date Received:	05/26/16
Matrix:	SO - Soil	Percent Solids:	80.2
Method:	SW846 8270D SW846 3546		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F157642.D	1	06/01/16	JJ	05/29/16	OP94344	EF6634
Run #2							

Run #	Initial Weight	Final Volume
Run #1	31.9 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	78	19	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	24	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	70	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	200	150	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	200	42	ug/kg	
95-48-7	2-Methylphenol	ND	78	25	ug/kg	
	3&4-Methylphenol	ND	78	32	ug/kg	
88-75-5	2-Nitrophenol	ND	200	26	ug/kg	
100-02-7	4-Nitrophenol	ND	390	100	ug/kg	
87-86-5	Pentachlorophenol	ND	200	37	ug/kg	
108-95-2	Phenol	ND	78	20	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	200	26	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	29	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	23	ug/kg	
83-32-9	Acenaphthene	ND	39	13	ug/kg	
208-96-8	Acenaphthylene	ND	39	20	ug/kg	
98-86-2	Acetophenone	ND	200	8.4	ug/kg	
120-12-7	Anthracene	ND	39	24	ug/kg	
1912-24-9	Atrazine	ND	78	17	ug/kg	
56-55-3	Benzo(a)anthracene	ND	39	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	39	18	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	39	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	39	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	39	18	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	78	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	78	9.5	ug/kg	
92-52-4	1,1'-Biphenyl	ND	78	5.4	ug/kg	
100-52-7	Benzaldehyde	ND	200	9.7	ug/kg	
91-58-7	2-Chloronaphthalene	ND	78	9.3	ug/kg	
106-47-8	4-Chloroaniline	ND	200	14	ug/kg	
86-74-8	Carbazole	ND	78	5.7	ug/kg	



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RA7 (4-5)
Lab Sample ID: JC21036-1
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: BMSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: 80.2

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	78	15	ug/kg	
218-01-9	Chrysene	ND	39	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	78	8.4	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	78	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	78	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	78	13	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	39	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	39	20	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	78	33	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	39	17	ug/kg	
132-64-9	Dibenzofuran	ND	78	16	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	78	6.4	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	78	9.7	ug/kg	
84-66-2	Diethyl phthalate	ND	78	8.3	ug/kg	
131-11-3	Dimethyl phthalate	ND	78	7.0	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	78	9.1	ug/kg	
206-44-0	Fluoranthene	ND	39	17	ug/kg	
86-73-7	Fluorene	ND	39	18	ug/kg	
118-74-1	Hexachlorobenzene	ND	78	9.9	ug/kg	
87-68-3	Hexachlorobutadiene	ND	39	16	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	390	16	ug/kg	
67-72-1	Hexachloroethane	ND	200	19	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	39	18	ug/kg	
78-59-1	Isophorone	ND	78	8.4	ug/kg	
90-12-0	1-Methylnaphthalene	ND	78	7.7	ug/kg	
91-57-6	2-Methylnaphthalene	ND	78	8.8	ug/kg	
88-74-4	2-Nitroaniline	ND	200	9.2	ug/kg	
99-09-2	3-Nitroaniline	ND	200	9.8	ug/kg	
100-01-6	4-Nitroaniline	ND	200	10	ug/kg	
98-95-3	Nitrobenzene	ND	78	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	78	11	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	14	ug/kg	
85-01-8	Phenanthrene	ND	39	13	ug/kg	
129-00-0	Pyrene	ND	39	13	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	200	9.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	80%		30-106%
4165-62-2	Phenol-d5	82%		30-106%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound



Report of Analysis

Client Sample ID: RA7 (4-5)
Lab Sample ID: JC21036-1
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: BMSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: 80.2

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	106%		24-140%
4165-60-0	Nitrobenzene-d5	92%		26-122%
321-60-8	2-Fluorobiphenyl	82%		36-112%
1718-51-0	Terphenyl-d14	86%		36-132%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID: RA7 (4-5)
Lab Sample ID: JC21036-1
Matrix: SO - Soil
Method: SW846 8270D BY SIM SW846 3546
Project: BSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: 80.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P16655.D	1	06/04/16	JJ	05/29/16	OP94344A	E4P886
Run #2							

	Initial Weight	Final Volume
Run #1	31.9 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane ^a	ND	3.9	0.79	ug/kg	
91-20-3	Naphthalene	ND	3.9	0.48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	75%		15-138%
321-60-8	2-Fluorobiphenyl	64%		12-148%
1718-51-0	Terphenyl-d14	77%		10-157%

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID:	RA7 (4-5)	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-1	Date Received:	05/26/16
Matrix:	SO - Soil	Percent Solids:	80.2
Method:	SW846-8015C (DAI)		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105263.D	1	05/27/16	XPL	n/a	n/a	GGH5304
Run #2							

Run #	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	86	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	73	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	71	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	50	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	68	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	66	ug/kg	
67-56-1	Methanol	ND	250	60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	83%		52-141%
111-27-3	Hexanol	88%		52-141%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID:	RA7 (4-5)	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-1	Date Received:	05/26/16
Matrix:	SO - Soil	Percent Solids:	80.2
Method:	SW846 8081B SW846 3546		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6G35639.D	1	05/31/16	RK	05/29/16	OP94338	G6G1025
Run #2							

	Initial Weight	Final Volume
Run #1	15.5 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.80	0.72	ug/kg	
319-84-6	alpha-BHC	ND	0.80	0.54	ug/kg	
319-85-7	beta-BHC	ND	0.80	0.50	ug/kg	
319-86-8	delta-BHC	ND	0.80	0.32	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.80	0.37	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.80	0.43	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.80	0.61	ug/kg	
60-57-1	Dieldrin	ND	0.80	0.63	ug/kg	
72-54-8	4,4'-DDD	ND	0.80	0.30	ug/kg	
72-55-9	4,4'-DDE	ND	0.80	0.27	ug/kg	
50-29-3	4,4'-DDT	ND	0.80	0.31	ug/kg	
72-20-8	Endrin	ND	0.80	0.28	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.80	0.46	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.80	0.60	ug/kg	
959-98-8	Endosulfan-I	ND	0.80	0.26	ug/kg	
33213-65-9	Endosulfan-II	ND	0.80	0.76	ug/kg	
76-44-8	Heptachlor	ND	0.80	0.66	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.80	0.33	ug/kg	
72-43-5	Methoxychlor	ND	1.6	0.45	ug/kg	
53494-70-5	Endrin ketone	ND	0.80	0.42	ug/kg	
8001-35-2	Toxaphene	ND	20	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	108%		24-136%
877-09-8	Tetrachloro-m-xylene	104%		24-136%
2051-24-3	Decachlorobiphenyl	109%		10-153%
2051-24-3	Decachlorobiphenyl	113%		10-153%



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 3

Client Sample ID: MW-22S (2, 7-3, 7)
 Lab Sample ID: JC21036-2
 Matrix: SO - Soil
 Method: SW846 8270D SW846 3546
 Project: BMSMC, Building 5 Area, PR

Date Sampled: 05/25/16
 Date Received: 05/26/16
 Percent Solids: 83.1

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F157643.D	1	06/01/16	JJ	05/29/16	OP94344	EF6634
Run #2							

Run #	Initial Weight	Final Volume
Run #1	31.3 g	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	77	19	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	24	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	33	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	68	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	190	140	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	190	41	ug/kg	
95-48-7	2-Methylphenol	ND	77	25	ug/kg	
	3&4-Methylphenol	ND	77	32	ug/kg	
88-75-5	2-Nitrophenol	ND	190	25	ug/kg	
100-02-7	4-Nitrophenol	ND	380	100	ug/kg	
87-86-5	Pentachlorophenol	ND	190	36	ug/kg	
108-95-2	Phenol	ND	77	20	ug/kg	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	190	25	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	29	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	23	ug/kg	
83-32-9	Acenaphthene	ND	38	13	ug/kg	
208-96-8	Acenaphthylene	ND	38	20	ug/kg	
98-86-2	Acetophenone	ND	190	8.3	ug/kg	
120-12-7	Anthracene	ND	38	24	ug/kg	
1912-24-9	Atrazine	ND	77	16	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	11	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	17	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	38	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	38	18	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	77	15	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	77	9.4	ug/kg	
92-52-4	1,1'-Biphenyl	ND	77	5.3	ug/kg	
100-52-7	Benzaldehyde	ND	190	9.5	ug/kg	
91-58-7	2-Chloronaphthalene	ND	77	9.2	ug/kg	
106-47-8	4-Chloroaniline	ND	190	14	ug/kg	
86-74-8	Carbazole	ND	77	5.6	ug/kg	



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-22S (2, 7-3, 7)
 Lab Sample ID: JC21036-2
 Matrix: SO - Soil
 Method: SW846 8270D SW846 3546
 Project: BMSMC, Building 5 Area, PR

Date Sampled: 05/25/16
 Date Received: 05/26/16
 Percent Solids: 83.1

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	77	15	ug/kg	
218-01-9	Chrysene	ND	38	12	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	77	8.2	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	77	17	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	77	14	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	77	12	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	38	12	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	38	19	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	77	32	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	17	ug/kg	
132-64-9	Dibenzofuran	ND	77	16	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	77	6.3	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	77	9.6	ug/kg	
84-66-2	Diethyl phthalate	ND	77	8.2	ug/kg	
131-11-3	Dimethyl phthalate	ND	77	6.8	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	77	9.0	ug/kg	
206-44-0	Fluoranthene	ND	38	17	ug/kg	
86-73-7	Fluorene	ND	38	18	ug/kg	
118-74-1	Hexachlorobenzene	ND	77	9.7	ug/kg	
87-68-3	Hexachlorobutadiene	ND	38	15	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	380	15	ug/kg	
67-72-1	Hexachloroethane	ND	190	19	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	38	18	ug/kg	
78-59-1	Isophorone	ND	77	8.2	ug/kg	
90-12-0	1-Methylnaphthalene	ND	77	7.5	ug/kg	
91-57-6	2-Methylnaphthalene	ND	77	8.7	ug/kg	
88-74-4	2-Nitroaniline	ND	190	9.1	ug/kg	
99-09-2	3-Nitroaniline	ND	190	9.6	ug/kg	
100-01-6	4-Nitroaniline	ND	190	10	ug/kg	
98-95-3	Nitrobenzene	ND	77	15	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	77	11	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	14	ug/kg	
85-01-8	Phenanthrene	ND	38	13	ug/kg	
129-00-0	Pyrene	ND	38	12	ug/kg	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	190	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		30-106%
4165-62-2	Phenol-d5	72%		30-106%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound



Report of Analysis

Client Sample ID: MW-22S (2.7-3.7)
Lab Sample ID: JC21036-2
Matrix: SO - Soil
Method: SW846 8270D SW846 3546
Project: BSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: 83.1

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
118-79-6	2,4,6-Tribromophenol	90%		24-140%
4165-60-0	Nitrobenzene-d5	87%		26-122%
321-60-8	2-Fluorobiphenyl	74%		36-112%
1718-51-0	Terphenyl-d14	77%		36-132%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID:	MW-22S (2.7-3.7)	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-2	Date Received:	05/26/16
Matrix:	SO - Soil	Percent Solids:	83.1
Method:	SW846 8270D BY SIM SW846 3546		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P16656.D	1	06/04/16	JJ	05/29/16	OP94344A	E4P886
Run #2							

	Initial Weight	Final Volume
Run #1	31.3 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane ^a	ND	3.8	0.77	ug/kg	
91-20-3	Naphthalene	ND	3.8	0.47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	74%		15-138%
321-60-8	2-Fluorobiphenyl	52%		12-148%
1718-51-0	Terphenyl-d14	72%		10-157%

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID: MW-22S (2,7-3,7)
Lab Sample ID: JC21036-2
Matrix: SO - Soil
Method: SW846-8015C (DAI)
Project: BSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: 83.1

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105266.D	1	05/27/16	XPL	n/a	n/a	GGH5304
Run #2							

Run #	Initial Weight
Run #1	5.0 g
Run #2	

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	120	83	ug/kg	
78-83-1	Isobutyl Alcohol	ND	120	71	ug/kg	
67-63-0	Isopropyl Alcohol	ND	120	69	ug/kg	
71-23-8	n-Propyl Alcohol	ND	120	48	ug/kg	
71-36-3	n-Butyl Alcohol	ND	120	65	ug/kg	
78-92-2	sec-Butyl Alcohol	ND	120	64	ug/kg	
67-56-1	Methanol	ND	240	58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	97%		52-141%
111-27-3	Hexanol	102%		52-141%



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID: MW-22S (2.7-3.7)
 Lab Sample ID: JC21036-2
 Matrix: SO - Soil
 Method: SW846 8081B SW846 3546
 Project: BMSMC, Building 5 Area, PR

Date Sampled: 05/25/16
 Date Received: 05/26/16
 Percent Solids: 83.1

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6G35642.D	1	05/31/16	RK	05/29/16	OP94338	G6G1025
Run #2							

Run #	Initial Weight	Final Volume
Run #1	15.6 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.77	0.69	ug/kg	
319-84-6	alpha-BHC	ND	0.77	0.51	ug/kg	
319-85-7	beta-BHC	ND	0.77	0.48	ug/kg	
319-86-8	delta-BHC	ND	0.77	0.30	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	0.77	0.35	ug/kg	
5103-71-9	alpha-Chlordane	ND	0.77	0.41	ug/kg	
5103-74-2	gamma-Chlordane	ND	0.77	0.59	ug/kg	
60-57-1	Dieldrin	ND	0.77	0.60	ug/kg	
72-54-8	4,4'-DDD	ND	0.77	0.29	ug/kg	
72-55-9	4,4'-DDE	ND	0.77	0.26	ug/kg	
50-29-3	4,4'-DDT	ND	0.77	0.29	ug/kg	
72-20-8	Endrin	ND	0.77	0.27	ug/kg	
1031-07-8	Endosulfan sulfate	ND	0.77	0.44	ug/kg	
7421-93-4	Endrin aldehyde	ND	0.77	0.57	ug/kg	
959-98-8	Endosulfan-I	ND	0.77	0.25	ug/kg	
33213-65-9	Endosulfan-II	ND	0.77	0.73	ug/kg	
76-44-8	Heptachlor	ND	0.77	0.63	ug/kg	
1024-57-3	Heptachlor epoxide	ND	0.77	0.32	ug/kg	
72-43-5	Methoxychlor	ND	1.5	0.43	ug/kg	
53494-70-5	Endrin ketone	ND	0.77	0.40	ug/kg	
8001-35-2	Toxaphene	ND	19	13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		24-136%
877-09-8	Tetrachloro-m-xylene	79%		24-136%
2051-24-3	Decachlorobiphenyl	83%		10-153%
2051-24-3	Decachlorobiphenyl	89%		10-153%



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 3

Client Sample ID:	RA7-GWD	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-3	Date Received:	05/26/16
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8270D SW846 3510C		
Project:	BMSMC, Building 5 Area, PR		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M124810.D	1	05/28/16	KD	05/27/16	OP94304	EM5286
Run #2							

Run #	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.6	0.91	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.6	0.99	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.2	1.4	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.6	2.7	ug/l	
51-28-5	2,4-Dinitrophenol	ND	11	1.7	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.6	1.4	ug/l	
95-48-7	2-Methylphenol	ND	2.2	0.99	ug/l	
	3&4-Methylphenol	ND	2.2	0.98	ug/l	
88-75-5	2-Nitrophenol	ND	5.6	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	11	1.3	ug/l	
87-86-5	Pentachlorophenol	ND	5.6	1.5	ug/l	
108-95-2	Phenol	ND	2.2	0.44	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.6	1.6	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.6	1.5	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.6	1.0	ug/l	
83-32-9	Acenaphthene	ND	1.1	0.21	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.15	ug/l	
98-86-2	Acetophenone	ND	2.2	0.23	ug/l	
120-12-7	Anthracene	ND	1.1	0.23	ug/l	
1912-24-9	Atrazine	ND	2.2	0.50	ug/l	
100-52-7	Benzaldehyde	ND	5.6	0.32	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.1	0.23	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.1	0.24	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.1	0.23	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.1	0.38	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.1	0.23	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.2	0.45	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.2	0.51	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.1	0.24	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.2	0.26	ug/l	
106-47-8	4-Chloroaniline	ND	5.6	0.38	ug/l	
86-74-8	Carbazole	ND	1.1	0.25	ug/l	



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RA7-GWD
Lab Sample ID: JC21036-3
Matrix: AQ - Ground Water
Method: SW846 8270D SW846 3510C
Project: BMSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: n/a

ABN TCL Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	5.3	2.2	0.72	ug/l	
218-01-9	Chrysene	ND	1.1	0.20	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.2	0.31	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.2	0.28	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	2.2	0.45	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.2	0.41	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.1	0.61	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.1	0.53	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.2	0.56	ug/l	
123-91-1	1,4-Dioxane	14.1	1.1	0.73	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.1	0.37	ug/l	
132-64-9	Dibenzofuran	ND	5.6	0.24	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.2	0.55	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.2	0.26	ug/l	
84-66-2	Diethyl phthalate	ND	2.2	0.29	ug/l	
131-11-3	Dimethyl phthalate	ND	2.2	0.24	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.2	1.8	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.19	ug/l	
86-73-7	Fluorene	ND	1.1	0.19	ug/l	
118-74-1	Hexachlorobenzene	ND	1.1	0.36	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.1	0.55	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	11	3.1	ug/l	
67-72-1	Hexachloroethane	ND	2.2	0.43	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.1	0.37	ug/l	
78-59-1	Isophorone	ND	2.2	0.31	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.29	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.23	ug/l	
88-74-4	2-Nitroaniline	ND	5.6	0.31	ug/l	
99-09-2	3-Nitroaniline	ND	5.6	0.43	ug/l	
100-01-6	4-Nitroaniline	ND	5.6	0.49	ug/l	
98-95-3	Nitrobenzene	ND	2.2	0.71	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.2	0.53	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.6	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.19	ug/l	
129-00-0	Pyrene	ND	1.1	0.24	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.2	0.41	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	50%		14-88%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound



Report of Analysis

Client Sample ID:	RA7-GWD	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-3	Date Received:	05/26/16
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8270D SW846 3510C		
Project:	BMSMC, Building 5 Area, PR		

ABN TCL Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	35%		10-110%
118-79-6	2,4,6-Tribromophenol	81%		39-149%
4165-60-0	Nitrobenzene-d5	74%		32-128%
321-60-8	2-Fluorobiphenyl	82%		35-119%
1718-51-0	Terphenyl-d14	72%		10-126%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID:	RA7-GWD	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-3	Date Received:	05/26/16
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8270D BY SIM SW846 3510C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M61773.D	1	05/29/16	AD	05/27/16	OP94304A	E3M2910
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
91-20-3	Naphthalene	ND	0.11	0.033	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	87%		24-125%
321-60-8	2-Fluorobiphenyl	78%		19-127%
1718-51-0	Terphenyl-d14	78%		10-119%



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID: RA7-GWD
Lab Sample ID: JC21036-3
Matrix: AQ - Ground Water
Method: SW846-8015C (DAI)
Project: BSMC, Building 5 Area, PR

Date Sampled: 05/25/16
Date Received: 05/26/16
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH105247.D	1	05/27/16	XPL	n/a	n/a	GGH5302
Run #2							

Low Molecular Alcohol List

CAS No.	Compound	Result	RL	MDL	Units	Q
64-17-5	Ethanol	ND	100	55	ug/l	
78-83-1	Isobutyl Alcohol	ND	100	36	ug/l	
67-63-0	Isopropyl Alcohol	ND	100	68	ug/l	
71-23-8	n-Propyl Alcohol	ND	100	43	ug/l	
71-36-3	n-Butyl Alcohol	ND	100	87	ug/l	
78-92-2	sec-Butyl Alcohol	ND	100	66	ug/l	
67-56-1	Methanol	ND	200	71	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	68%		56-145%
111-27-3	Hexanol	75%		56-145%



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS Accutest

Report of Analysis

Page 1 of 1

Client Sample ID:	RA7-GWD	Date Sampled:	05/25/16
Lab Sample ID:	JC21036-3	Date Received:	05/26/16
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8081B SW846 3510C		
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4G68705.D	1	05/28/16	DS	05/27/16	OP94316	G4G1803
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.011	0.0067	ug/l	
319-84-6	alpha-BHC	ND	0.011	0.0067	ug/l	
319-85-7	beta-BHC	ND	0.011	0.0063	ug/l	
319-86-8	delta-BHC	ND	0.011	0.0051	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.011	0.0031	ug/l	
5103-71-9	alpha-Chlordane	ND	0.011	0.0051	ug/l	
5103-74-2	gamma-Chlordane	ND	0.011	0.0051	ug/l	
60-57-1	Dieldrin	ND	0.011	0.0040	ug/l	
72-54-8	4,4'-DDD	ND	0.011	0.0042	ug/l	
72-55-9	4,4'-DDE	ND	0.011	0.0068	ug/l	
50-29-3	4,4'-DDT	ND	0.011	0.0055	ug/l	
72-20-8	Endrin	ND	0.011	0.0056	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.011	0.0058	ug/l	
7421-93-4	Endrin aldehyde	ND	0.011	0.0057	ug/l	
53494-70-5	Endrin ketone	ND	0.011	0.0056	ug/l	
959-98-8	Endosulfan-I	ND	0.011	0.0055	ug/l	
33213-65-9	Endosulfan-II	ND	0.011	0.0048	ug/l	
76-44-8	Heptachlor	ND	0.011	0.0042	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.011	0.0073	ug/l	
72-43-5	Methoxychlor	ND	0.022	0.0063	ug/l	
8001-35-2	Toxaphene	ND	0.28	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%		26-132%
877-09-8	Tetrachloro-m-xylene	56%		26-132%
2051-24-3	Decachlorobiphenyl	66%		10-118%
2051-24-3	Decachlorobiphenyl	57%		10-118%



ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94304-MS	M124805.D	1	05/27/16	KD	05/27/16	OP94304	EM5286
OP94304-MSD	M124806.D	1	05/27/16	KD	05/27/16	OP94304	EM5286
JC21036-3	M124810.D	1	05/28/16	KD	05/27/16	OP94304	EM5286

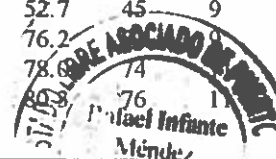
The QC reported here applies to the following samples:

Method: SW846 8270D

JC21036-3

CAS No.	Compound	JC21036-3 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	ND	105	71.2	68	105	79.0	75	10	49-110/20
59-50-7	4-Chloro-3-methyl phenol	ND	105	75.3	72	105	82.1	78	9	44-121/18
120-83-2	2,4-Dichlorophenol	ND	105	73.4	70	105	81.4	77	10	42-120/19
105-67-9	2,4-Dimethylphenol	ND	105	81.3	77	105	88.2	84	8	33-132/23
51-28-5	2,4-Dinitrophenol	ND	211	173	82	211	194	92	11	21-145/26
534-52-1	4,6-Dinitro-o-cresol	ND	105	76.6	73	105	86.5	82	12	25-134/27
95-48-7	2-Methylphenol	ND	105	72.9	69	105	79.7	76	9	47-112/18
	3&4-Methylphenol	ND	105	71.5	68	105	78.2	74	9	44-113/19
88-75-5	2-Nitrophenol	ND	105	73.3	70	105	81.4	77	10	45-118/20
100-02-7	4-Nitrophenol	ND	105	70.9	67	105	77.1	73	8	23-144/28
87-86-5	Pentachlorophenol	ND	105	77.8	74	105	87.9	84	12	25-151/25
108-95-2	Phenol	ND	105	61.5	58	105	64.5	61	5	22-100/22
58-90-2	2,3,4,6-Tetrachlorophenol	ND	105	72.5	69	105	79.4	75	9	44-122/21
95-95-4	2,4,5-Trichlorophenol	ND	105	69.7	66	105	76.9	73	10	51-124/20
88-06-2	2,4,6-Trichlorophenol	ND	105	73.0	69	105	80.7	77	10	53-120/21
83-32-9	Acenaphthene	ND	105	68.4	65	105	76.4	73	11	52-120/23
208-96-8	Acenaphthylene	ND	105	65.3	62	105	72.9	69	11	50-101/22
98-86-2	Acetophenone	ND	105	68.8	65	105	76.8	73	11	31-141/23
120-12-7	Anthracene	ND	105	69.2	66	105	76.9	73	11	54-117/22
1912-24-9	Atrazine	ND	105	77.0	73	105	85.4	81	10	42-152/23
100-52-7	Benzaldehyde	ND	105	85.4	81	105	93.5	89	9	10-164/30
56-55-3	Benzo(a)anthracene	ND	105	70.7	67	105	78.3	74	10	40-123/24
50-32-8	Benzo(a)pyrene	ND	105	67.7	64	105	74.1	70	9	41-127/25
205-99-2	Benzo(b)fluoranthene	ND	105	66.3	63	105	75.1	71	12	39-127/27
191-24-2	Benzo(g,h,i)perylene	ND	105	66.8	63	105	74.9	71	11	34-128/28
207-08-9	Benzo(k)fluoranthene	ND	105	69.6	66	105	76.1	72	9	39-122/26
101-55-3	4-Bromophenyl phenyl ether	ND	105	71.8	68	105	79.5	76	10	51-124/23
85-68-7	Butyl benzyl phthalate	ND	105	75.6	72	105	83.3	79	10	21-146/28
92-52-4	1,1'-Biphenyl	ND	105	70.6	67	105	79.2	75	11	27-142/23
91-58-7	2-Chloronaphthalene	ND	105	65.3	62	105	72.5	69	10	51-109/23
106-47-8	4-Chloroaniline	ND	105	67.3	64	105	60.6	58	10	10-110/55
86-74-8	Carbazole	ND	105	73.4	70	105	81.7	78	11	52-116/22
105-60-2	Caprolactam	5.3	105	48.4	41	105	52.7	45	9	10-106/34
218-01-9	Chrysene	ND	105	69.3	66	105	76.2	74	11	41-128/24
111-91-1	bis(2-Chloroethoxy)methane	ND	105	69.6	66	105	78.6	76	11	46-120/24
111-44-4	bis(2-Chloroethyl)ether	ND	105	71.7	68	105	80.3	76	11	42-123/28

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94304-MS	M124805.D	1	05/27/16	KD	05/27/16	OP94304	EM5286
OP94304-MSD	M124806.D	1	05/27/16	KD	05/27/16	OP94304	EM5286
JC21036-3	M124810.D	1	05/28/16	KD	05/27/16	OP94304	EM5286

The QC reported here applies to the following samples:

Method: SW846 8270D

JC21036-3

CAS No.	Compound	JC21036-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
108-60-1	bis(2-Chloroisopropyl)ether	ND		105	60.0	57	105	67.6	64	12	41-117/25
7005-72-3	4-Chlorophenyl phenyl ether	ND		105	68.8	65	105	76.1	72	10	48-121/21
121-14-2	2,4-Dinitrotoluene	ND		105	72.0	68	105	78.6	75	9	54-123/27
606-20-2	2,6-Dinitrotoluene	ND		105	74.9	71	105	83.0	79	10	55-125/26
91-94-1	3,3'-Dichlorobenzidine	ND		211	106	50	211	107	51	1	10-107/47
123-91-1	1,4-Dioxane	14.1		105	70.2	53	105	76.4	59	8	10-119/31
53-70-3	Dibenzo(a,h)anthracene	ND		105	66.5	63	105	74.6	71	11	35-130/27
132-64-9	Dibenzofuran	ND		105	69.3	66	105	77.0	73	11	53-112/22
84-74-2	Di-n-butyl phthalate	ND		105	74.8	71	105	82.7	79	10	38-129/23
117-84-0	Di-n-octyl phthalate	ND		105	72.0	68	105	79.8	76	10	35-145/26
84-66-2	Diethyl phthalate	ND		105	70.8	67	105	78.1	74	10	16-136/30
131-11-3	Dimethyl phthalate	ND		105	70.4	67	105	77.8	74	10	10-143/39
117-81-7	bis(2-Ethylhexyl)phthalate	ND		105	74.9	71	105	82.7	79	10	34-141/28
206-44-0	Fluoranthene	ND		105	70.0	67	105	77.7	74	10	47-123/24
86-73-7	Fluorene	ND		105	67.9	65	105	75.3	72	10	56-117/22
118-74-1	Hexachlorobenzene	ND		105	69.3	66	105	76.6	73	10	46-125/24
87-68-3	Hexachlorobutadiene	ND		105	49.7	47	105	62.3	59	23	26-121/24
77-47-4	Hexachlorocyclopentadiene	ND		211	113	54	211	123	58	8	10-133/31
67-72-1	Hexachloroethane	ND		105	48.7	46	105	63.6	60	27* a	35-111/26
193-39-5	Indeno(1,2,3-cd)pyrene	ND		105	66.9	64	105	75.8	72	12	32-130/30
78-59-1	Isophorone	ND		105	73.2	70	105	80.8	77	10	47-126/23
90-12-0	1-Methylnaphthalene	ND		105	68.1	65	105	76.0	72	11	34-124/25
91-57-6	2-Methylnaphthalene	ND		105	66.7	63	105	73.8	70	10	34-123/24
88-74-4	2-Nitroaniline	ND		105	70.3	67	105	79.1	75	12	46-137/23
99-09-2	3-Nitroaniline	ND		105	70.7	67	105	68.1	65	4	10-110/50
100-01-6	4-Nitroaniline	ND		105	75.2	71	105	80.7	77	7	38-118/25
98-95-3	Nitrobenzene	ND		105	65.9	63	105	72.9	69	10	35-130/25
621-64-7	N-Nitroso-di-n-propylamine	ND		105	63.8	61	105	71.0	67	11	45-123/22
86-30-6	N-Nitrosodiphenylamine	ND		105	70.2	67	105	77.6	74	10	46-123/24
85-01-8	Phenanthrene	ND		105	69.6	66	105	77.2	73	10	48-121/23
129-00-0	Pyrene	ND		105	74.0	70	105	82.1	78	10	43-124/26
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		105	69.4	66	105	76.7	73	10	25-142/24

* = Outside of Control Limits.



SGS

58 of 1485

JC21036

Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94304-MS	M124805.D	1	05/27/16	KD	05/27/16	OP94304	EM5286
OP94304-MSD	M124806.D	1	05/27/16	KD	05/27/16	OP94304	EM5286
JC21036-3	M124810.D	1	05/28/16	KD	05/27/16	OP94304	EM5286

The QC reported here applies to the following samples:

Method: SW846 8270D

JC21036-3

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-3	Limits
367-12-4	2-Fluorophenol	65%	69%	50%	14-88%
4165-62-2	Phenol-d5	54%	58%	35%	10-110%
118-79-6	2,4,6-Tribromophenol	72%	81%	81%	39-149%
4165-60-0	Nitrobenzene-d5	66%	74%	74%	32-128%
321-60-8	2-Fluorobiphenyl	68%	76%	82%	35-119%
1718-51-0	Terphenyl-d14	70%	77%	72%	10-126%

(a) Analytical precision exceeds in-house control limits.



* = Outside of Control Limits.

SGS

59 of 1485
JC21036

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BMSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94344-MS	F157632.D	1	05/31/16	BP	05/29/16	OP94344	EF6633
OP94344-MSD	F157743.D	1	06/03/16	BP	05/29/16	OP94344	EF6638
JC21036-1	F157642.D	1	06/01/16	JJ	05/29/16	OP94344	EF6634

The QC reported here applies to the following samples:

Method: SW846 8270D

JC21036-1, JC21036-2

CAS No.	Compound	JC21036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
95-57-8	2-Chlorophenol	ND		2040	1580	77	2050	1640	80	4	33-106/35
59-50-7	4-Chloro-3-methyl phenol	ND		2040	1800	88	2050	1670	81	7	27-124/34
120-83-2	2,4-Dichlorophenol	ND		2040	1490	73	2050	1330	65	11	25-122/34
105-67-9	2,4-Dimethylphenol	ND		2040	2090	102	2050	1870	91	11	23-133/34
51-28-5	2,4-Dinitrophenol	ND		4090	1200	29	4100	1870	46	44	10-110/51
534-52-1	4,6-Dinitro-o-cresol	ND		2040	1150	56	2050	1630	79	35	10-113/49
95-48-7	2-Methylphenol	ND		2040	1760	86	2050	1800	88	2	32-111/34
	3&4-Methylphenol	ND		2040	1810	89	2050	1840	90	2	32-113/34
88-75-5	2-Nitrophenol	ND		2040	1480	72	2050	1300	63	13	17-118/37
100-02-7	4-Nitrophenol	ND		2040	2070	101	2050	2450	119	17	14-154/39
87-86-5	Pentachlorophenol	ND		2040	1850	91	2050	1730	84	7	10-131/43
108-95-2	Phenol	ND		2040	1780	87	2050	1840	90	3	25-112/33
58-90-2	2,3,4,6-Tetrachlorophenol	ND		2040	1690	83	2050	1610	79	5	19-125/37
95-95-4	2,4,5-Trichlorophenol	ND		2040	1620	79	2050	1690	82	4	30-125/35
88-06-2	2,4,6-Trichlorophenol	ND		2040	1820	89	2050	1810	88	1	26-126/35
83-32-9	Acenaphthene	ND		2040	1730	85	2050	1710	83	1	34-125/36
208-96-8	Acenaphthylene	ND		2040	1700	83	2050	1680	82	1	28-113/34
98-86-2	Acetophenone	ND		2040	1920	94	2050	1980	97	3	26-120/34
120-12-7	Anthracene	ND		2040	1720	84	2050	1710	83	1	31-131/41
1912-24-9	Atrazine	ND		2040	1980	97	2050	1880	92	5	34-138/36
56-55-3	Benzo(a)anthracene	ND		2040	1640	80	2050	1630	79	1	23-136/43
50-32-8	Benzo(a)pyrene	ND		2040	1700	83	2050	1680	82	1	22-144/42
205-99-2	Benzo(b)fluoranthene	ND		2040	1700	83	2050	1740	85	2	18-145/43
191-24-2	Benzo(g,h,i)perylene	ND		2040	1690	83	2050	1670	81	1	20-138/43
207-08-9	Benzo(k)fluoranthene	ND		2040	1690	83	2050	1720	84	2	27-129/43
101-55-3	4-Bromophenyl phenyl ether	ND		2040	1830	90	2050	1730	84	6	39-124/33
85-68-7	Butyl benzyl phthalate	ND		2040	1790	88	2050	1710	83	5	27-143/35
92-52-4	1,1'-Biphenyl	ND		2040	1700	83	2050	1740	85	2	33-116/32
100-52-7	Benzaldehyde	ND		2040	1530	75	2050	1710	83	11	20-129/34
91-58-7	2-Chloronaphthalene	ND		2040	1690	83	2050	1690	82	0	38-110/32
106-47-8	4-Chloroaniline	ND		2040	1160	57	2050	879	43	28	10-110/49
86-74-8	Carbazole	ND		2040	1660	81	2050	1700	83	2	27-129/38
105-60-2	Caprolactam	ND		2040	1310	64	2050	1110	54	17	18-127/35
218-01-9	Chrysene	ND		2040	1590	78	2050	1600	78	1	21-142/43
111-91-1	bis(2-Chloroethoxy)methane	ND		2040	1650	81	2050	1430	93	1	32-116/33
111-44-4	bis(2-Chloroethyl)ether	ND		2040	1730	85	2050	1980	93	1	30-113/37

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BMSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94344-MS	F157632.D	1	05/31/16	BP	05/29/16	OP94344	EF6633
OP94344-MSD	F157743.D	1	06/03/16	BP	05/29/16	OP94344	EF6638
JC21036-1	F157642.D	1	06/01/16	JJ	05/29/16	OP94344	EF6634

The QC reported here applies to the following samples:

Method: SW846 8270D

JC21036-1, JC21036-2

CAS No.	Compound	JC21036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
108-60-1	bis(2-Chloroisopropyl)ether	ND		2040	1450	71	2050	1540	75	6	28-110/33
7005-72-3	4-Chlorophenyl phenyl ether	ND		2040	1810	89	2050	1840	90	2	38-119/33
121-14-2	2,4-Dinitrotoluene	ND		2040	1740	85	2050	1920	94	10	28-126/36
606-20-2	2,6-Dinitrotoluene	ND		2040	1760	86	2050	1820	89	3	31-126/34
91-94-1	3,3'-Dichlorobenzidine	ND		4090	3290	80	4100	2640	64	22	10-115/44
53-70-3	Dibenzo(a,h)anthracene	ND		2040	1750	86	2050	1770	86	1	25-135/41
132-64-9	Dibenzofuran	ND		2040	1650	81	2050	1680	82	2	30-125/35
84-74-2	Di-n-butyl phthalate	ND		2040	1900	93	2050	1830	89	4	32-131/34
117-84-0	Di-n-octyl phthalate	ND		2040	1750	86	2050	1730	84	1	28-144/35
84-66-2	Diethyl phthalate	ND		2040	1830	90	2050	1810	88	1	35-124/32
131-11-3	Dimethyl phthalate	ND		2040	1770	87	2050	1780	87	1	36-121/33
117-81-7	bis(2-Ethylhexyl)phthalate	ND		2040	1820	89	2050	1700	83	7	25-146/35
206-44-0	Fluoranthene	ND		2040	1690	83	2050	1740	85	3	15-143/46
86-73-7	Fluorene	ND		2040	1830	90	2050	1850	90	1	30-129/37
118-74-1	Hexachlorobenzene	ND		2040	1960	96	2050	1880	92	4	34-125/34
87-68-3	Hexachlorobutadiene	ND		2040	1620	79	2050	1390	68	15	29-120/34
77-47-4	Hexachlorocyclopentadiene	ND		4090	1970	48	4100	2530	62	25	10-127/46
67-72-1	Hexachloroethane	ND		2040	1430	70	2050	1500	73	5	21-109/38
193-39-5	Indeno(1,2,3-cd)pyrene	ND		2040	1750	86	2050	1770	86	1	23-141/44
78-59-1	Isophorone	ND		2040	1990	97	2050	1720	84	15	31-124/32
90-12-0	1-Methylnaphthalene	ND		2040	1580	77	2050	1380	67	14	24-122/33
91-57-6	2-Methylnaphthalene	ND		2040	1550	76	2050	1360	66	13	21-125/33
88-74-4	2-Nitroaniline	ND		2040	2260	111	2050	2350	115	4	29-138/33
99-09-2	3-Nitroaniline	ND		2040	1290	63	2050	1230	60	5	12-112/38
100-01-6	4-Nitroaniline	ND		2040	1370	67	2050	1360	66	1	21-117/38
98-95-3	Nitrobenzene	ND		2040	1920	94	2050	1680	82	13	28-118/32
621-64-7	N-Nitroso-di-n-propylamine	ND		2040	1980	97	2050	2000	98	1	26-121/34
86-30-6	N-Nitrosodiphenylamine	ND		2040	1840	90	2050	1730	84	6	24-142/35
85-01-8	Phenanthrene	ND		2040	1730	85	2050	1720	84	1	14-144/44
129-00-0	Pyrene	ND		2040	1710	84	2050	1600	78	7	16-147/46
95-94-3	1,2,4,5-Tetrachlorobenzene	ND		2040	1650	81	2050	1620	79	2	37-115/32

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-1	Limits
367-12-4	2-Fluorophenol	78%	79%	80%	30-106%

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94344-MS	F157632.D	1	05/31/16	BP	05/29/16	OP94344	EF6633
OP94344-MSD	F157743.D	1	06/03/16	BP	05/29/16	OP94344	EF6638
JC21036-1	F157642.D	1	06/01/16	JJ	05/29/16	OP94344	EF6634

The QC reported here applies to the following samples:

Method: SW846 8270D

JC21036-1, JC21036-2

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-1	Limits
4165-62-2	Phenol-d5	83%	85%	82%	30-106%
118-79-6	2,4,6-Tribromophenol	108%	107%	106%	24-140%
4165-60-0	Nitrobenzene-d5	93%	84%	92%	26-122%
321-60-8	2-Fluorobiphenyl	87%	87%	82%	36-112%
1718-51-0	Terphenyl-d14	93%	87%	86%	36-132%



* = Outside of Control Limits

SGS

62 of 1485
JC21036

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94304A-MS	3M61778.D	1	05/30/16	AD	05/27/16	OP94304A	E3M2911
OP94304A-MSD	3M61779.D	1	05/30/16	AD	05/27/16	OP94304A	E3M2911
JC21036-3	3M61773.D	1	05/29/16	AD	05/27/16	OP94304A	E3M2910

The QC reported here applies to the following samples:

Method: SW846 8270D BY SIM

JC21036-3

CAS No.	Compound	JC21036-3 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
91-20-3	Naphthalene	ND	2.11	1.55	74	2.11	1.76	84	13	23-140/36

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-3	Limits
367-12-4	2-Fluorophenol	55%	67%		14-81%
4165-62-2	Phenol-d5	44%	55%* ^a		11-54%
118-79-6	2,4,6-Tribromophenol	79%	83%		35-145%
4165-60-0	Nitrobenzene-d5	71%	88%	87%	24-125%
321-60-8	2-Fluorobiphenyl	68%	78%	78%	19-127%
1718-51-0	Terphenyl-d14	68%	75%	78%	10-119%

(a) Outside of in house control limits, but within reasonable method recovery limits.



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BMSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94344A-MS	4P16653.D	1	06/04/16	JJ	05/29/16	OP94344A	E4P886
OP94344A-MSD	4P16654.D	1	06/04/16	JJ	05/29/16	OP94344A	E4P886
JC21036-1	4P16655.D	1	06/04/16	JJ	05/29/16	OP94344A	E4P886

The QC reported here applies to the following samples:

Method: SW846 8270D BY SIM

JC21036-1, JC21036-2

CAS No.	Compound	JC21036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
123-91-1	1,4-Dioxane	ND		40	15.3	38* ^a	41.3	15.4	37* ^a	1	50-150/30
91-20-3	Naphthalene	ND		40	30.9	77	41.3	31.1	75	1	10-190/36

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-1	Limits
4165-60-0	Nitrobenzene-d5	86%	80%	75%	15-138%
321-60-8	2-Fluorobiphenyl	63%	72%	64%	12-148%
1718-51-0	Terphenyl-d14	78%	75%	77%	10-157%

(a) Outside of in house control limits.



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC21036-3MS	GH105248.D	1	05/27/16	XPL	n/a	n/a	GGH5302
JC21036-3MSD	GH105249.D	1	05/27/16	XPL	n/a	n/a	GGH5302
JC21036-3	GH105247.D	1	05/27/16	XPL	n/a	n/a	GGH5302

The QC reported here applies to the following samples:

Method: SW846-8015C (DAI)

JC21036-3

CAS No.	Compound	JC21036-3 ug/l	Spike Q	ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
64-17-5	Ethanol	ND	5000	5330	107	5000	4560	91	16	58-145/27	
78-83-1	Isobutyl Alcohol	ND	5000	5200	104	5000	5250	105	1	69-131/25	
67-63-0	Isopropyl Alcohol	ND	5000	5340	107	5000	4730	95	12	70-133/28	
71-23-8	n-Propyl Alcohol	ND	5000	5330	107	5000	5100	102	4	66-137/29	
71-36-3	n-Butyl Alcohol	ND	5000	4990	100	5000	5480	110	9	63-131/25	
78-92-2	sec-Butyl Alcohol	ND	5000	5160	103	5000	4880	98	6	64-136/25	
67-56-1	Methanol	ND	5000	5120	102	5000	4750	95	7	48-148/34	

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-3	Limits
111-27-3	Hexanol	86%	96%	68%	56-145%
111-27-3	Hexanol	91%	103%	75%	56-145%



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC21036-1MS	GH105264.D	1	05/27/16	XPL	n/a	n/a	GGH5304
JC21036-1MSD	GH105265.D	1	05/27/16	XPL	n/a	n/a	GGH5304
JC21036-1	GH105263.D	1	05/27/16	XPL	n/a	n/a	GGH5304

The QC reported here applies to the following samples:

Method: SW846-8015C (DAI)

JC21036-1, JC21036-2

CAS No.	Compound	JC21036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
64-17-5	Ethanol	ND		6230	6210	100	6230	6430	103	3	64-132/22
78-83-1	Isobutyl Alcohol	ND		6230	5850	94	6230	6200	99	6	59-141/26
67-63-0	Isopropyl Alcohol	ND		6230	6070	97	6230	6330	102	4	69-131/23
71-23-8	n-Propyl Alcohol	ND		6230	6350	102	6230	6590	106	4	66-135/31
71-36-3	n-Butyl Alcohol	ND		6230	5380	86	6230	5610	90	4	50-140/30
78-92-2	sec-Butyl Alcohol	ND		6230	6190	99	6230	6400	103	3	67-131/30
67-56-1	Methanol	ND		6230	6410	103	6230	6570	105	2	58-130/29

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-1	Limits
111-27-3	Hexanol	86%	95%	83%	52-141%
111-27-3	Hexanol	91%	101%	88%	52-141%



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BMSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94316-MS	4G68706.D	1	05/28/16	DS	05/27/16	OP94316	G4G1803
OP94316-MSD	4G68707.D	1	05/28/16	DS	05/27/16	OP94316	G4G1803
JC21036-3	4G68705.D	1	05/28/16	DS	05/27/16	OP94316	G4G1803

The QC reported here applies to the following samples:

Method: SW846 8081B

JC21036-3

CAS No.	Compound	JC21036-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
309-00-2	Aldrin	ND		0.278	0.29	104	0.278	0.30	108	3	37-159/40
319-84-6	alpha-BHC	ND		0.278	0.27	97	0.278	0.28	101	4	37-164/37
319-85-7	beta-BHC	ND		0.278	0.28	101	0.278	0.29	104	4	46-151/36
319-86-8	delta-BHC	ND		0.278	0.32	115	0.278	0.33	119	3	32-168/36
58-89-9	gamma-BHC (Lindane)	ND		0.278	0.29	104	0.278	0.31	112	7	44-160/37
5103-71-9	alpha-Chlordane	ND		0.278	0.30	108	0.278	0.31	112	3	38-160/35
5103-74-2	gamma-Chlordane	ND		0.278	0.29	104	0.278	0.29	104	0	39-157/37
60-57-1	Dieldrin	ND		0.278	0.30	108	0.278	0.29	104	3	42-161/36
72-54-8	4,4'-DDD	ND		0.278	0.27	97	0.278	0.28	101	4	40-161/36
72-55-9	4,4'-DDE	ND		0.278	0.30	108	0.278	0.30	108	0	34-158/36
50-29-3	4,4'-DDT	ND		0.278	0.31	112	0.278	0.30	108	3	41-173/33
72-20-8	Endrin	ND		0.278	0.23	83	0.278	0.24	86	4	44-166/35
1031-07-8	Endosulfan sulfate	ND		0.278	0.29	104	0.278	0.30	108	3	46-161/36
7421-93-4	Endrin aldehyde	ND		0.278	0.23	83	0.278	0.23	83	0	34-149/36
53494-70-5	Endrin ketone	ND		0.278	0.30	108	0.278	0.31	112	3	44-157/36
959-98-8	Endosulfan-I	ND		0.278	0.29	104	0.278	0.29	104	0	43-154/35
33213-65-9	Endosulfan-II	ND		0.278	0.31	112	0.278	0.31	112	0	40-162/35
76-44-8	Heptachlor	ND		0.278	0.22	79	0.278	0.23	83	4	33-153/37
1024-57-3	Heptachlor epoxide	ND		0.278	0.27	97	0.278	0.27	97	0	45-154/37
72-43-5	Methoxychlor	ND		0.278	0.30	108	0.278	0.31	112	3	48-169/32
8001-35-2	Toxaphene	ND			ND			ND		nc	50-150/30

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-3	Limits
877-09-8	Tetrachloro-m-xylene	85%	90%	69%	26-132%
877-09-8	Tetrachloro-m-xylene	73%	73%	56%	26-132%
2051-24-3	Decachlorobiphenyl	66%	80%	66%	10-118%
2051-24-3	Decachlorobiphenyl	57%	65%	57%	10-118%



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC21036

Account: AMANYWP Anderson, Mulholland & Associates

Project: BSMC, Building 5 Area, PR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP94338-MS	6G35640.D	1	05/31/16	RK	05/29/16	OP94338	G6G1025
OP94338-MSD	6G35641.D	1	05/31/16	RK	05/29/16	OP94338	G6G1025
JC21036-1	6G35639.D	1	05/31/16	RK	05/29/16	OP94338	G6G1025

The QC reported here applies to the following samples:

Method: SW846 8081B

JC21036-1, JC21036-2

CAS No.	Compound	JC21036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
309-00-2	Aldrin	ND		20.1	24.9	124	20.4	25.1	123	1	19-147/48
319-84-6	alpha-BHC	ND		20.1	24.8	123	20.4	25.0	123	1	13-155/50
319-85-7	beta-BHC	ND		20.1	21.2	105	20.4	20.5	101	3	10-145/53
319-86-8	delta-BHC	ND		20.1	25.2	125	20.4	24.8	122	2	11-148/51
58-89-9	gamma-BHC (Lindane)	ND		20.1	20.8	103	20.4	20.7	102	0	16-143/47
5103-71-9	alpha-Chlordane	ND		20.1	23.6	117	20.4	23.1	113	2	15-151/50
5103-74-2	gamma-Chlordane	ND		20.1	24.6	122	20.4	24.1	118	2	13-151/50
60-57-1	Dieldrin	ND		20.1	24.1	120	20.4	24.1	118	0	10-157/54
72-54-8	4,4'-DDD	ND		20.1	23.9	119	20.4	23.3	114	3	10-157/52
72-55-9	4,4'-DDE	ND		20.1	25.8	128	20.4	25.0	123	3	10-155/49
50-29-3	4,4'-DDT	ND		20.1	22.5	112	20.4	21.9	107	3	10-187/49
72-20-8	Endrin	ND		20.1	24.1	120	20.4	23.5	115	3	14-154/53
1031-07-8	Endosulfan sulfate	ND		20.1	22.8	113	20.4	22.1	108	3	16-140/55
7421-93-4	Endrin aldehyde	ND		20.1	22.0	109	20.4	20.7	102	6	10-156/51
959-98-8	Endosulfan-I	ND		20.1	22.0	109	20.4	21.4	105	3	12-142/47
33213-65-9	Endosulfan-II	ND		20.1	23.6	117	20.4	23.1	113	2	10-150/52
76-44-8	Heptachlor	ND		20.1	24.2	120	20.4	24.6	121	2	10-159/49
1024-57-3	Heptachlor epoxide	ND		20.1	22.2	110	20.4	21.8	107	2	16-150/51
72-43-5	Methoxychlor	ND		20.1	22.2	110	20.4	21.8	107	2	10-166/52
53494-70-5	Endrin ketone	ND		20.1	23.5	117	20.4	23.0	113	2	10-171/52
8001-35-2	Toxaphene	ND			ND			ND		nc	50-150/30

CAS No.	Surrogate Recoveries	MS	MSD	JC21036-1	Limits
877-09-8	Tetrachloro-m-xylene	105%	100%	108%	24-136%
877-09-8	Tetrachloro-m-xylene	100%	97%	104%	24-136%
2051-24-3	Decachlorobiphenyl	107%	104%	109%	10-153%
2051-24-3	Decachlorobiphenyl	112%	110%	113%	10-153%



* = Outside of Control Limits.

SGS

50
GW
ACCUTEST - NJ

CHAIN OF CUSTODY

SGS Accutest - Dayton
2233 Route 130, Dayton, NJ 08510
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

PAGE 1 OF 1

801219535880

SGS Accutest Order #

SGS Accutest Job #

JC21036

Company Name Anderson Molholland Assoc. Inc. 2700 Westchester Purchase NY Terry Taylor 914-251-0400 T. Taylor, N. Rivera, D. Lindstrand		Project Name BMS Release Assessment Client Humacao PR Project # Client Purchase Order # Project Manager SGS Account Number 801219535880		SGS Accutest Job # JC21036	
Field ID / Point of Collection RA7(4-5) RA7(4-5)MS RA7(4-5)MSD MW-229(2.7-3.7) RA7-GWD RA7-GWD-MS RA7-GWD-MSD		Collection Date Time Sample by Matrix # of bottles # of containers 05/25/16 1010 TT 50 2 05/25/16 1010 TT 50 2 05/25/16 1010 TT 50 2 05/25/16 1112 NR 50 2 05/25/16 1330 TT GW 6 3 05/25/16 1330 TT GW 6 3 05/25/16 1330 TT GW 6 3		Number of prepared bottles SVOC - Method 8270D LMA - Method 8015B Particulates Method 8091A 1,4 Dioxane + Naphthalene by Method 8270D SIM	
Turnaround Time (Business days) 1-5 Business Days for soil samples 3-5 Business Days for aqueous		Date Deliverable Information Commercial "A" (Level 1) Commercial "B" (Level 2) FULL T1 (Level 3+4) NJ Reduced Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only, Commercial "B" = Results + OC Summary NJ Reduced = Results + OC Summary + Partial Raw data		Comments / Special Instructions Add to Report 1-methyl naphthalene with SVOC Method 8270D	
Emergency & Rush TLA data available via Lablink 1 Rush TLA data available via Lablink		Sample Custody must be documented below each time samples change possession, including courier delivery. 1 Fed Ex 2 3 4 5		Sample inventory is verified upon receipt in the Laboratory 1 2 3 4 5	

JC21036: Chain of Custody

Page 1 of 2

SGS

28 of 1485

ACCUTEST

JC21035

EXECUTIVE NARRATIVE

SDG No: JC21036 Laboratory: Accutest, New Jersey
Analysis: SW846-8270D Number of Samples: 3
Location: BMSMC, Building 5 Area
Humacao, PR

SUMMARY: Seven (7) samples were analyzed for the ABN TCL list following method SW846-8270D; Naphthalene and 1,4-Dioxane were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. Semivolatile Data Validation. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: None
Major: None
Minor: None

Critical findings: None
Major findings: None
Minor findings:

1. Initial and continuing calibration verifications meet the required criteria. Analytes not meeting the method % difference criteria meet the guidance document performance criteria for continuing calibration verification of ± 25 or 40 %, no action taken.

Analytes not meeting the % difference continuing calibration criteria were qualified as estimated (J) or (UJ) in affected samples.

No closing calibration verification included in data package. No action taken, professional judgment.

GCMS instrument GCMS3P used in the scan mode for QC samples on 06/10/16. Several analytes missed the % difference criteria. No action taken, QC samples are not validated.

GCMS instrument GCMS4M used in the SIM mode for QC samples on 06/07/16. % difference met the guidance document criteria. QC samples are not validated.

2. MS/MSD % recoveries RPD outside the in-house limits but within generally acceptable control limits for Hexachloroethane in the MS/MSD QC aqueous sample for this sample batch. No action taken, MS/MSD results apply to unspiked sample. Unspiked samples were from another project.

MS/MSD % recoveries under the lower laboratory control limits in sample JC21036-1MS/MSD. 1,4-dioxane not detected in sample JC21036-1. Non-detects are qualified as (R) in affected samples.

COMMENTS:

Results are valid and can be used for decision making purposes.

Reviewers Name:

Rafael Infante
Chemist License 1888

Signature:



Date:

June 14, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC21036-1

Sample location: BMSMC Building 5 Area

Sampling date: 5/25/2016

Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	78	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	200	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	200	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	200	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	200	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	200	ug/kg	1	-	UJ	Yes
2-Methylphenol	78	ug/kg	1	-	U	Yes
3&4-Methylphenol	78	ug/kg	1	-	UJ	Yes
2-Nitrophenol	200	ug/kg	1	-	U	Yes
4-Nitrophenol	390	ug/kg	1	-	UJ	Yes
Pentachlorophenol	200	ug/kg	1	-	U	Yes
Phenol	78	ug/kg	1	-	UJ	Yes
2,3,4,6-Tetrachlorophenol	200	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	200	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	200	ug/kg	1	-	U	Yes
Acenaphthene	39	ug/kg	1	-	U	Yes
Acenaphthylene	39	ug/kg	1	-	U	Yes
Acetophenone	200	ug/kg	1	-	UJ	Yes
Anthracene	39	ug/kg	1	-	U	Yes
Atrazine	78	ug/kg	1	-	U	Yes
Benzo(a)anthracene	39	ug/kg	1	-	U	Yes
Benzo(a)pyrene	39	ug/kg	1	-	U	Yes
Benzo(b)fluoranthene	39	ug/kg	1	-	U	Yes
Benzo(g,h,i)perylene	39	ug/kg	1	-	U	Yes
Benzo(k)fluoranthene	39	ug/kg	1	-	U	Yes
4-Bromophenyl phenyl ether	78	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	78	ug/kg	1	-	U	Yes
1,1'-Biphenyl	78	ug/kg	1	-	U	Yes
Benzaldehyde	200	ug/kg	1	-	U	Yes
2-Chloronaphthalene	78	ug/kg	1	-	U	Yes
4-Chloroaniline	200	ug/kg	1	-	U	Yes
Carbazole	78	ug/kg	1	-	U	Yes
Caprolactam	78	ug/kg	1	-	U	Yes
Chrysene	39	ug/kg	1	-	U	Yes
bis(2-Chloroethoxy)methane	78	ug/kg	1	-	U	Yes

bis(2-Chloroethyl)ether	78	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	78	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	78	ug/kg	1	-	U	Yes
2,4-Dinitrotoluene	39	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	39	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	78	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	39	ug/kg	1	-	U	Yes
Dibenzofuran	78	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	78	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	78	ug/kg	1	-	U	Yes
Diethyl phthalate	78	ug/kg	1	-	U	Yes
Dimethyl phthalate	78	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	78	ug/kg	1	-	U	Yes
Fluoranthene	39	ug/kg	1	-	U	Yes
Fluorene	39	ug/kg	1	-	U	Yes
Hexachlorobenzene	78	ug/kg	1	-	U	Yes
Hexachlorobutadiene	39	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	390	ug/kg	1	-	U	Yes
Hexachloroethane	200	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	39	ug/kg	1	-	U	Yes
Isophorone	78	ug/kg	1	-	U	Yes
1-Methylnaphthalene	78	ug/kg	1	-	U	Yes
2-Methylnaphthalene	78	ug/kg	1	-	U	Yes
2-Nitroaniline	200	ug/kg	1	-	UJ	Yes
3-Nitroaniline	200	ug/kg	1	-	U	Yes
4-Nitroaniline	200	ug/kg	1	-	U	Yes
Nitrobenzene	78	ug/kg	1	-	UJ	Yes
N-Nitroso-di-n-propylamine	78	ug/kg	1	-	UJ	Yes
Nitrosodiphenylamine	200	ug/kg	1	-	U	Yes
Phenanthrene	39	ug/kg	1	-	U	Yes
Pyrene	39	ug/kg	J	-	U	Yes
1,2,4,5-Tetrachlorobenzene	200	ug/kg	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	3.9	ug/kg	1	-	U	Yes
1,4-Dioxane	3.9	ug/kg	1	-	R	Yes

Sample ID: JC21036-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	77	ug/kg	1	-	U	Yes
4-Chloro-3-methyl phenol	190	ug/kg	1	-	U	Yes
2,4-Dichlorophenol	190	ug/kg	1	-	U	Yes
2,4-Dimethylphenol	190	ug/kg	1	-	U	Yes
2,4-Dinitrophenol	190	ug/kg	1	-	U	Yes
4,6-Dinitro-o-cresol	190	ug/kg	1	-	UJ	Yes
2-Methylphenol	77	ug/kg	1	-	U	Yes
3&4-Methylphenol	77	ug/kg	1	-	UJ	Yes
2-Nitrophenol	190	ug/kg	1	-	U	Yes
4-Nitrophenol	380	ug/kg	1	-	UJ	Yes
Pentachlorophenol	190	ug/kg	1	-	U	Yes
Phenol	77	ug/kg	1	-	UJ	Yes
2,3,4,6-Tetrachlorophenol	190	ug/kg	1	-	U	Yes
2,4,5-Trichlorophenol	190	ug/kg	1	-	U	Yes
2,4,6-Trichlorophenol	190	ug/kg	1	-	U	Yes
Acenaphthene	38	ug/kg	1	-	U	Yes
Acenaphthylene	38	ug/kg	1	-	U	Yes
Acetophenone	190	ug/kg	1	-	UJ	Yes
Anthracene	38	ug/kg	1	-	U	Yes
Atrazine	77	ug/kg	1	-	U	Yes
Benzo(a)anthracene	38	ug/kg	1	-	U	Yes
Benzo(a)pyrene	38	ug/kg	1	-	U	Yes
Benzo(b)fluoranthene	38	ug/kg	1	-	U	Yes
Benzo(g,h,i)perylene	38	ug/kg	1	-	U	Yes
Benzo(k)fluoranthene	38	ug/kg	1	-	U	Yes
4-Bromophenyl phenyl ether	77	ug/kg	1	-	U	Yes
Butyl benzyl phthalate	77	ug/kg	1	-	U	Yes
1,1'-Biphenyl	77	ug/kg	1	-	U	Yes
Benzaldehyde	190	ug/kg	1	-	U	Yes
2-Chloronaphthalene	77	ug/kg	1	-	U	Yes
4-Chloroaniline	190	ug/kg	1	-	U	Yes
Carbazole	77	ug/kg	1	-	U	Yes
Caprolactam	77	ug/kg	1	-	U	Yes
Chrysene	38	ug/kg	1	-	U	Yes
bis(2-Chloroethoxy)methane	77	ug/kg	1	-	U	Yes

bis(2-Chloroethyl)ether	77	ug/kg	1	-	U	Yes
bis(2-Chloroisopropyl)ether	77	ug/kg	1	-	U	Yes
4-Chlorophenyl phenyl ether	77	ug/kg	1	-	U	Yes
2,4-Dinitrotoluene	38	ug/kg	1	-	U	Yes
2,6-Dinitrotoluene	38	ug/kg	1	-	U	Yes
3,3'-Dichlorobenzidine	77	ug/kg	1	-	U	Yes
Dibenzo(a,h)anthracene	38	ug/kg	1	-	U	Yes
Dibenzofuran	77	ug/kg	1	-	U	Yes
Di-n-butyl phthalate	77	ug/kg	1	-	U	Yes
Di-n-octyl phthalate	77	ug/kg	1	-	U	Yes
Diethyl phthalate	77	ug/kg	1	-	U	Yes
Dimethyl phthalate	77	ug/kg	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	77	ug/kg	1	-	U	Yes
Fluoranthene	38	ug/kg	1	-	U	Yes
Fluorene	38	ug/kg	1	-	U	Yes
Hexachlorobenzene	77	ug/kg	1	-	U	Yes
Hexachlorobutadiene	38	ug/kg	1	-	U	Yes
Hexachlorocyclopentadiene	380	ug/kg	1	-	U	Yes
Hexachloroethane	190	ug/kg	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	38	ug/kg	1	-	U	Yes
Isophorone	77	ug/kg	1	-	U	Yes
1-Methylnaphthalene	77	ug/kg	1	-	U	Yes
2-Methylnaphthalene	77	ug/kg	1	-	U	Yes
2-Nitroaniline	190	ug/kg	1	-	UJ	Yes
3-Nitroaniline	190	ug/kg	1	-	U	Yes
4-Nitroaniline	190	ug/kg	1	-	U	Yes
Nitrobenzene	77	ug/kg	1	-	UJ	Yes
N-Nitroso-di-n-propylamine	77	ug/kg	1	-	UJ	Yes
Nitrosodiphenylamine	190	ug/kg	1	-	U	Yes
Phenanthrene	38	ug/kg	1	-	U	Yes
Pyrene	38	ug/kg	J	-	U	Yes
1,2,4,5-Tetrachlorobenzene	190	ug/kg	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	3.8	ug/kg	1	-	U	Yes
1,4-Dioxane	3.8	ug/kg	1	-	U	Yes

Sample ID: JC21036-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	5.6	ug/l	1	-	U	Yes
4-Chloro-3-methyl phenol	5.6	ug/l	1	-	U	Yes
2,4-Dichlorophenol	2.2	ug/l	1	-	U	Yes
2,4-Dimethylphenol	5.6	ug/l	1	-	U	Yes
2,4-Dinitrophenol	11	ug/l	1	-	U	Yes
4,6-Dinitro-o-cresol	5.6	ug/l	1	-	U	Yes
2-Methylphenol	2.2	ug/l	1	-	U	Yes
3&4-Methylphenol	2.2	ug/l	1	-	U	Yes
2-Nitrophenol	5.6	ug/l	1	-	U	Yes
4-Nitrophenol	11	ug/l	1	-	U	Yes
Pentachlorophenol	5.6	ug/l	1	-	U	Yes
Phenol	2.2	ug/l	1	-	U	Yes
2,3,4,6-Tetrachlorophenol	5.6	ug/l	1	-	U	Yes
2,4,5-Trichlorophenol	5.6	ug/l	1	-	U	Yes
2,4,6-Trichlorophenol	5.6	ug/l	1	-	U	Yes
Acenaphthene	1.1	ug/l	1	-	U	Yes
Acenaphthylene	1.1	ug/l	1	-	U	Yes
Acetophenone	2.2	ug/l	1	-	U	Yes
Anthracene	1.1	ug/l	1	-	U	Yes
Atrazine	2.2	ug/l	1	-	U	Yes
Benzaldehyde	5.6	ug/l	1	-	U	Yes
Benzo(a)anthracene	1.1	ug/l	1	-	U	Yes
Benzo(a)pyrene	1.1	ug/l	1	-	U	Yes
Benzo(b)fluoranthene	1.1	ug/l	1	-	U	Yes
Benzo(g,h,i)perylene	1.1	ug/l	1	-	U	Yes
Benzo(k)fluoranthene	1.1	ug/l	1	-	U	Yes
4-Bromophenyl phenyl ether	2.2	ug/l	1	-	U	Yes
Butyl benzyl phthalate	2.2	ug/l	1	-	U	Yes
1,1'-Biphenyl	1.1	ug/l	1	-	U	Yes
2-Chloronaphthalene	2.2	ug/l	1	-	U	Yes
4-Chloroaniline	5.6	ug/l	1	-	U	Yes
Carbazole	1.1	ug/l	1	-	U	Yes
Caprolactam	5.3	ug/l	1	-	-	Yes
Chrysene	1.1	ug/l	1	-	U	Yes

bis(2-Chloroethoxy)methane	2.2	ug/l	1	-	U	Yes
bis(2-Chloroethyl)ether	2.2	ug/l	1	-	U	Yes
bis(2-Chloroisopropyl)ether	2.2	ug/l	1	-	U	Yes
4-Chlorophenyl phenyl ether	2.2	ug/l	1	-	U	Yes
2,4-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
2,6-Dinitrotoluene	1.1	ug/l	1	-	U	Yes
3,3'-Dichlorobenzidine	2.2	ug/l	1	-	U	Yes
1,4-Dioxane	14.1	ug/l	1	-	-	Yes
Dibenzo(a,h)anthracene	1.1	ug/l	1	-	U	Yes
Dibenzofuran	5.6	ug/l	1	-	U	Yes
Di-n-butyl phthalate	2.2	ug/l	1	-	U	Yes
Di-n-octyl phthalate	2.2	ug/l	1	-	U	Yes
Diethyl phthalate	2.2	ug/l	1	-	U	Yes
Dimethyl phthalate	2.2	ug/l	1	-	U	Yes
bis(2-Ethylhexyl)phthalate	2.2	ug/l	1	-	U	Yes
Fluoranthene	1.1	ug/l	1	-	U	Yes
Fluorene	1.1	ug/l	1	-	U	Yes
Hexachlorobenzene	1.1	ug/l	1	-	U	Yes
Hexachlorobutadiene	1.1	ug/l	1	-	U	Yes
Hexachlorocyclopentadiene	11	ug/l	1	-	U	Yes
Hexachloroethane	2.2	ug/l	1	-	U	Yes
Indeno(1,2,3-cd)pyrene	1.1	ug/l	1	-	U	Yes
Isophorone	2.2	ug/l	1	-	U	Yes
1-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Methylnaphthalene	1.1	ug/l	1	-	U	Yes
2-Nitroaniline	5.6	ug/l	1	-	U	Yes
3-Nitroaniline	5.6	ug/l	1	-	U	Yes
4-Nitroaniline	5.6	ug/l	1	-	U	Yes
Nitrobenzene	2.2	ug/l	1	-	U	Yes
N-Nitroso-di-n-propylamine	2.2	ug/l	1	-	U	Yes
Nitrosodiphenylamine	5.6	ug/l	1	-	U	Yes
Phenanthrene	1.1	ug/l	1	-	U	Yes
Pyrene	1.1	ug/l	1	-	U	Yes
1,2,4,5-Tetrachlorobenzene	2.2	ug/l	1	-	U	Yes

METHOD: 8270D (SIM)

Naphthalene	0.161	ug/l	1	-	-	Yes
-------------	-------	------	---	---	---	-----

Sample ID: JC21036-3MS
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	71.2	ug/l	1	-	-	Yes
4-Chloro-3-methyl phenol	75.3	ug/l	1	-	-	Yes
2,4-Dichlorophenol	73.4	ug/l	1	-	-	Yes
2,4-Dimethylphenol	81.3	ug/l	1	-	-	Yes
2,4-Dinitrophenol	173	ug/l	1	-	-	Yes
4,6-Dinitro-o-cresol	76.6	ug/l	1	-	-	Yes
2-Methylphenol	72.9	ug/l	1	-	-	Yes
3&4-Methylphenol	71.5	ug/l	1	-	-	Yes
2-Nitrophenol	73.3	ug/l	1	-	-	Yes
4-Nitrophenol	71	ug/l	1	-	-	Yes
Pentachlorophenol	77.8	ug/l	1	-	-	Yes
Phenol	61.5	ug/l	1	-	-	Yes
2,3,4,6-Tetrachlorophenol	72.5	ug/l	1	-	-	Yes
2,4,5-Trichlorophenol	69.7	ug/l	1	-	-	Yes
2,4,6-Trichlorophenol	73.0	ug/l	1	-	-	Yes
Acenaphthene	68.4	ug/l	1	-	-	Yes
Acenaphthylene	65.3	ug/l	1	-	-	Yes
Acetophenone	68.8	ug/l	1	-	-	Yes
Anthracene	69.2	ug/l	1	-	-	Yes
Atrazine	77.0	ug/l	1	-	-	Yes
Benzaldehyde	85.4	ug/l	1	-	-	Yes
Benzo(a)anthracene	70.7	ug/l	1	-	-	Yes
Benzo(a)pyrene	67.7	ug/l	1	-	-	Yes
Benzo(b)fluoranthene	66.3	ug/l	1	-	-	Yes
Benzo(g,h,i)perylene	66.8	ug/l	1	-	-	Yes
Benzo(k)fluoranthene	69.6	ug/l	1	-	-	Yes
4-Bromophenyl phenyl ether	71.8	ug/l	1	-	-	Yes
Butyl benzyl phthalate	75.6	ug/l	1	-	-	Yes
1,1'-Biphenyl	70.6	ug/l	1	-	-	Yes
2-Chloronaphthalene	65.3	ug/l	1	-	-	Yes
4-Chloroaniline	67.3	ug/l	1	-	-	Yes
Carbazole	73.4	ug/l	1	-	-	Yes
Caprolactam	48.4	ug/l	1	-	-	Yes
Chrysene	69.3	ug/l	1	-	-	Yes
bis(2-Chloroethoxy)methane	69.6	ug/l	1	-	-	Yes

bis(2-Chloroethyl)ether	71.7	ug/l	1	-	-	Yes
bis(2-Chloroisopropyl)ether	60.0	ug/l	1	-	-	Yes
4-Chlorophenyl phenyl ether	68.8	ug/l	1	-	-	Yes
2,4-Dinitrotoluene	72.0	ug/l	1	-	-	Yes
2,6-Dinitrotoluene	74.9	ug/l	1	-	-	Yes
3,3'-Dichlorobenzidine	106	ug/l	1	-	-	Yes
1,4-Dioxane	70.2	ug/l	1	-	-	Yes
Dibenzo(a,h)anthracene	66.5	ug/l	1	-	-	Yes
Dibenzofuran	69.3	ug/l	1	-	-	Yes
Di-n-butyl phthalate	74.8	ug/l	1	-	-	Yes
Di-n-octyl phthalate	72.0	ug/l	1	-	-	Yes
Diethyl phthalate	70.8	ug/l	1	-	-	Yes
Dimethyl phthalate	70.4	ug/l	1	-	-	Yes
bis(2-Ethylhexyl)phthalate	74.9	ug/l	1	-	-	Yes
Fluoranthene	70.0	ug/l	1	-	-	Yes
Fluorene	67.9	ug/l	1	-	-	Yes
Hexachlorobenzene	69.3	ug/l	1	-	-	Yes
Hexachlorobutadiene	49.7	ug/l	1	-	-	Yes
Hexachlorocyclopentadiene	113	ug/l	1	-	-	Yes
Hexachloroethane	48.7	ug/l	1	-	-	Yes
Indeno(1,2,3-cd)pyrene	66.9	ug/l	1	-	-	Yes
Isophorone	73.2	ug/l	1	-	-	Yes
1-Methylnaphthalene	68.1	ug/l	1	-	-	Yes
2-Methylnaphthalene	66.7	ug/l	1	-	-	Yes
2-Nitroaniline	70.3	ug/l	1	-	-	Yes
3-Nitroaniline	70.7	ug/l	1	-	-	Yes
4-Nitroaniline	75.2	ug/l	1	-	-	Yes
Nitrobenzene	65.9	ug/l	1	-	-	Yes
N-Nitroso-di-n-propylamine	63.8	ug/l	1	-	-	Yes
Nitrosodiphenylamine	70.2	ug/l	1	-	-	Yes
Phenanthrene	69.6	ug/l	1	-	-	Yes
Pyrene	74.0	ug/l	1	-	-	Yes
1,2,4,5-Tetrachlorobenzene	69.4	ug/l	1	-	-	Yes

METHOD: 8270D (SIM)

Naphthalene	2.11	ug/l	1	-	-	Yes
-------------	------	------	---	---	---	-----

Sample ID: JC21036-3MSD
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	79.0	ug/l	1	-	-	Yes
4-Chloro-3-methyl phenol	82.1	ug/l	1	-	-	Yes
2,4-Dichlorophenol	81.4	ug/l	1	-	-	Yes
2,4-Dimethylphenol	88.2	ug/l	1	-	-	Yes
2,4-Dinitrophenol	194	ug/l	1	-	-	Yes
4,6-Dinitro-o-cresol	86.5	ug/l	1	-	-	Yes
2-Methylphenol	79.7	ug/l	1	-	-	Yes
3&4-Methylphenol	78.2	ug/l	1	-	-	Yes
2-Nitrophenol	81.4	ug/l	1	-	-	Yes
4-Nitrophenol	77.1	ug/l	1	-	-	Yes
Pentachlorophenol	87.9	ug/l	1	-	-	Yes
Phenol	64.5	ug/l	1	-	-	Yes
2,3,4,6-Tetrachlorophenol	79.4	ug/l	1	-	-	Yes
2,4,5-Trichlorophenol	76.9	ug/l	1	-	-	Yes
2,4,6-Trichlorophenol	80.7	ug/l	1	-	-	Yes
Acenaphthene	76.4	ug/l	1	-	-	Yes
Acenaphthylene	72.9	ug/l	1	-	-	Yes
Acetophenone	76.8	ug/l	1	-	-	Yes
Anthracene	76.9	ug/l	1	-	-	Yes
Atrazine	85.4	ug/l	1	-	-	Yes
Benzaldehyde	93.5	ug/l	1	-	-	Yes
Benzo(a)anthracene	78.3	ug/l	1	-	-	Yes
Benzo(a)pyrene	74.1	ug/l	1	-	-	Yes
Benzo(b)fluoranthene	75.1	ug/l	1	-	-	Yes
Benzo(g,h,i)perylene	74.9	ug/l	1	-	-	Yes
Benzo(k)fluoranthene	76.1	ug/l	1	-	-	Yes
4-Bromophenyl phenyl ether	79.5	ug/l	1	-	-	Yes
Butyl benzyl phthalate	83.3	ug/l	1	-	-	Yes
1,1'-Biphenyl	79.2	ug/l	1	-	-	Yes
2-Chloronaphthalene	72.5	ug/l	1	-	-	Yes
4-Chloroaniline	60.6	ug/l	1	-	-	Yes
Carbazole	81.7	ug/l	1	-	-	Yes
Caprolactam	52.7	ug/l	1	-	-	Yes
Chrysene	76.2	ug/l	1	-	-	Yes
bis(2-Chloroethoxy)methane	78.0	ug/l	1	-	-	Yes

bis(2-Chloroethyl)ether	80.3	ug/l	1	-	-	Yes
bis(2-Chloroisopropyl)ether	67.6	ug/l	1	-	-	Yes
4-Chlorophenyl phenyl ether	76.1	ug/l	1	-	-	Yes
2,4-Dinitrotoluene	78.6	ug/l	1	-	-	Yes
2,6-Dinitrotoluene	83.0	ug/l	1	-	-	Yes
3,3'-Dichlorobenzidine	107	ug/l	1	-	-	Yes
1,4-Dioxane	76.4	ug/l	1	-	-	Yes
Dibenzo(a,h)anthracene	74.6	ug/l	1	-	-	Yes
Dibenzofuran	77.0	ug/l	1	-	-	Yes
Di-n-butyl phthalate	82.7	ug/l	1	-	-	Yes
Di-n-octyl phthalate	79.8	ug/l	1	-	-	Yes
Diethyl phthalate	78.1	ug/l	1	-	-	Yes
Dimethyl phthalate	77.8	ug/l	1	-	-	Yes
bis(2-Ethylhexyl)phthalate	82.7	ug/l	1	-	-	Yes
Fluoranthene	77.7	ug/l	1	-	-	Yes
Fluorene	75.3	ug/l	1	-	-	Yes
Hexachlorobenzene	76.6	ug/l	1	-	-	Yes
Hexachlorobutadiene	62.3	ug/l	1	-	-	Yes
Hexachlorocyclopentadiene	123	ug/l	1	-	-	Yes
Hexachloroethane	63.6	ug/l	1	-	-	Yes
Indeno(1,2,3-cd)pyrene	75.8	ug/l	1	-	-	Yes
Isophorone	80.8	ug/l	1	-	-	Yes
1-Methylnaphthalene	76.0	ug/l	1	-	-	Yes
2-Methylnaphthalene	73.8	ug/l	1	-	-	Yes
2-Nitroaniline	79.1	ug/l	1	-	-	Yes
3-Nitroaniline	68.1	ug/l	1	-	-	Yes
4-Nitroaniline	80.7	ug/l	1	-	-	Yes
Nitrobenzene	72.9	ug/l	1	-	-	Yes
N-Nitroso-di-n-propylamine	71.0	ug/l	1	-	-	Yes
Nitrosodiphenylamine	77.6	ug/l	1	-	-	Yes
Phenanthrene	77.2	ug/l	1	-	-	Yes
Pyrene	82.1	ug/l	1	-	-	Yes
1,2,4,5-Tetrachlorobenzene	76.7	ug/l	1	-	-	Yes

METHOD: 8270D (SIM)

Naphthalene	1.76	ug/l	1	-	-	Yes
-------------	------	------	---	---	---	-----

Sample ID: JC21036-1MS
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	1580	ug/kg	1	-	-	Yes
4-Chloro-3-methyl phenol	1800	ug/kg	1	-	-	Yes
2,4-Dichlorophenol	1490	ug/kg	1	-	-	Yes
2,4-Dimethylphenol	2090	ug/kg	1	-	J	Yes
2,4-Dinitrophenol	1200	ug/kg	1	-	-	Yes
4,6-Dinitro-o-cresol	1150	ug/kg	1	-	-	Yes
2-Methylphenol	1760	ug/kg	1	-	J	Yes
3&4-Methylphenol	1810	ug/kg	1	-	J	Yes
2-Nitrophenol	1480	ug/kg	1	-	-	Yes
4-Nitrophenol	2070	ug/kg	1	-	-	Yes
Pentachlorophenol	1850	ug/kg	1	-	-	Yes
Phenol	1780	ug/kg	1	-	-	Yes
2,3,4,6-Tetrachlorophenol	1690	ug/kg	1	-	-	Yes
2,4,5-Trichlorophenol	1620	ug/kg	1	-	-	Yes
2,4,6-Trichlorophenol	1820	ug/kg	1	-	-	Yes
Acenaphthene	1730	ug/kg	1	-	-	Yes
Acenaphthylene	1700	ug/kg	1	-	-	Yes
Acetophenone	1920	ug/kg	1	-	J	Yes
Anthracene	1720	ug/kg	1	-	-	Yes
Atrazine	1980	ug/kg	1	-	-	Yes
Benzo(a)anthracene	1640	ug/kg	1	-	-	Yes
Benzo(a)pyrene	1700	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	1700	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	1690	ug/kg	1	-	-	Yes
Benzo(k)fluoranthene	1690	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	1830	ug/kg	1	-	-	Yes
Butyl benzyl phthalate	1790	ug/kg	1	-	-	Yes
1,1'-Biphenyl	1700	ug/kg	1	-	-	Yes
Benzaldehyde	1530	ug/kg	1	-	J	Yes
2-Chloronaphthalene	1690	ug/kg	1	-	-	Yes
4-Chloroaniline	1160	ug/kg	1	-	-	Yes
Carbazole	1660	ug/kg	1	-	-	Yes
Caprolactam	1310	ug/kg	1	-	-	Yes
Chrysene	1590	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	1650	ug/kg	1	-	-	Yes

bis(2-Chloroethyl)ether	1730	ug/kg	1	-	-	Yes
bis(2-Chloroisopropyl)ether	1450	ug/kg	1	-	-	Yes
4-Chlorophenyl phenyl ether	1810	ug/kg	1	-	-	Yes
2,4-Dinitrotoluene	1740	ug/kg	1	-	-	Yes
2,6-Dinitrotoluene	1760	ug/kg	1	-	-	Yes
3,3'-Dichlorobenzidine	3290	ug/kg	1	-	-	Yes
Dibenzo(a,h)anthracene	1750	ug/kg	1	-	-	Yes
Dibenzofuran	1650	ug/kg	1	-	-	Yes
Di-n-butyl phthalate	1900	ug/kg	1	-	-	Yes
Di-n-octyl phthalate	1750	ug/kg	1	-	-	Yes
Diethyl phthalate	1830	ug/kg	1	-	-	Yes
Dimethyl phthalate	1770	ug/kg	1	-	-	Yes
bis(2-Ethylhexyl)phthalate	1820	ug/kg	1	-	-	Yes
Fluoranthene	1690	ug/kg	1	-	-	Yes
Fluorene	1830	ug/kg	1	-	-	Yes
Hexachlorobenzene	1960	ug/kg	1	-	-	Yes
Hexachlorobutadiene	1620	ug/kg	1	-	-	Yes
Hexachlorocyclopentadiene	1970	ug/kg	1	-	-	Yes
Hexachloroethane	1430	ug/kg	1	-	-	Yes
Indeno(1,2,3-cd)pyrene	1750	ug/kg	1	-	-	Yes
Isophorone	1990	ug/kg	1	-	-	Yes
1-Methylnaphthalene	1580	ug/kg	1	-	-	Yes
2-Methylnaphthalene	1550	ug/kg	1	-	-	Yes
2-Nitroaniline	2260	ug/kg	1	-	J	Yes
3-Nitroaniline	1290	ug/kg	1	-	-	Yes
4-Nitroaniline	1370	ug/kg	1	-	-	Yes
Nitrobenzene	1920	ug/kg	1	-	J	Yes
N-Nitroso-di-n-propylamine	1980	ug/kg	1	-	J	Yes
Nitrosodiphenylamine	1840	ug/kg	1	-	-	Yes
Phenanthrene	1730	ug/kg	1	-	-	Yes
Pyrene	1710	ug/kg	J	-	-	Yes
1,2,4,5-Tetrachlorobenzene	1650	ug/kg	1	-	-	Yes

METHOD: 8270D (SIM)

Naphthalene	30.9	ug/kg	1	-	-	Yes
1,4-Dioxane	15.3	ug/kg	1	-	-	Yes

Sample ID: JC21036-1MSD
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Soil

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
2-Chlorophenol	1640	ug/kg	1	-	-	Yes
4-Chloro-3-methyl phenol	1670	ug/kg	1	-	-	Yes
2,4-Dichlorophenol	1330	ug/kg	1	-	-	Yes
2,4-Dimethylphenol	1870	ug/kg	1	-	-	Yes
2,4-Dinitrophenol	1870	ug/kg	1	-	-	Yes
4,6-Dinitro-o-cresol	1630	ug/kg	1	-	-	Yes
2-Methylphenol	1800	ug/kg	1	-	-	Yes
3&4-Methylphenol	1840	ug/kg	1	-	-	Yes
2-Nitrophenol	1300	ug/kg	1	-	-	Yes
4-Nitrophenol	2450	ug/kg	1	-	-	Yes
Pentachlorophenol	1730	ug/kg	1	-	-	Yes
Phenol	1840	ug/kg	1	-	-	Yes
2,3,4,6-Tetrachlorophenol	1610	ug/kg	1	-	-	Yes
2,4,5-Trichlorophenol	1690	ug/kg	1	-	-	Yes
2,4,6-Trichlorophenol	1810	ug/kg	1	-	-	Yes
Acenaphthene	1710	ug/kg	1	-	-	Yes
Acenaphthylene	1680	ug/kg	1	-	-	Yes
Acetophenone	1980	ug/kg	1	-	-	Yes
Anthracene	1710	ug/kg	1	-	-	Yes
Atrazine	1880	ug/kg	1	-	-	Yes
Benzo(a)anthracene	1630	ug/kg	1	-	-	Yes
Benzo(a)pyrene	1680	ug/kg	1	-	-	Yes
Benzo(b)fluoranthene	1740	ug/kg	1	-	-	Yes
Benzo(g,h,i)perylene	1670	ug/kg	1	-	-	Yes
Benzo(k)fluoranthene	1720	ug/kg	1	-	-	Yes
4-Bromophenyl phenyl ether	1730	ug/kg	1	-	-	Yes
Butyl benzyl phthalate	1710	ug/kg	1	-	-	Yes
1,1'-Biphenyl	1740	ug/kg	1	-	-	Yes
Benzaldehyde	1710	ug/kg	1	-	-	Yes
2-Chloronaphthalene	1690	ug/kg	1	-	-	Yes
4-Chloroaniline	879	ug/kg	1	-	-	Yes
Carbazole	1700	ug/kg	1	-	-	Yes
Caprolactam	1110	ug/kg	1	-	-	Yes
Chrysene	1600	ug/kg	1	-	-	Yes
bis(2-Chloroethoxy)methane	1430	ug/kg	1	-	-	Yes
bis(2-Chloroethyl)ether	1910	ug/kg	1	-	-	Yes
bis(2-Chloroisopropyl)ether	1540	ug/kg	1	-	-	Yes

4-Chlorophenyl phenyl ether	1840	ug/kg	1	-	-	Yes
2,4-Dinitrotoluene	1920	ug/kg	1	-	-	Yes
2,6-Dinitrotoluene	1820	ug/kg	1	-	-	Yes
3,3'-Dichlorobenzidine	2640	ug/kg	1	-	-	Yes
Dibenzo(a,h)anthracene	1770	ug/kg	1	-	-	Yes
Dibenzofuran	1680	ug/kg	1	-	-	Yes
Di-n-butyl phthalate	1830	ug/kg	1	-	-	Yes
Di-n-octyl phthalate	1730	ug/kg	1	-	-	Yes
Diethyl phthalate	1810	ug/kg	1	-	-	Yes
Dimethyl phthalate	1780	ug/kg	1	-	-	Yes
bis(2-Ethylhexyl)phthalate	1700	ug/kg	1	-	-	Yes
Fluoranthene	1740	ug/kg	1	-	-	Yes
Fluorene	1850	ug/kg	1	-	-	Yes
Hexachlorobenzene	1880	ug/kg	1	-	-	Yes
Hexachlorobutadiene	1390	ug/kg	1	-	-	Yes
Hexachlorocyclopentadiene	2530	ug/kg	1	-	-	Yes
Hexachloroethane	1500	ug/kg	1	-	-	Yes
Indeno(1,2,3-cd)pyrene	1770	ug/kg	1	-	-	Yes
Isophorone	1720	ug/kg	1	-	-	Yes
1-Methylnaphthalene	1380	ug/kg	1	-	-	Yes
2-Methylnaphthalene	1360	ug/kg	1	-	-	Yes
2-Nitroaniline	2350	ug/kg	1	-	-	Yes
3-Nitroaniline	1230	ug/kg	1	-	-	Yes
4-Nitroaniline	1360	ug/kg	1	-	-	Yes
Nitrobenzene	1680	ug/kg	1	-	-	Yes
N-Nitroso-di-n-propylamine	2000	ug/kg	1	-	-	Yes
Nitrosodiphenylamine	1730	ug/kg	1	-	-	Yes
Phenanthrene	1720	ug/kg	1	-	-	Yes
Pyrene	1600	ug/kg	J	-	-	Yes
1,2,4,5-Tetrachlorobenzene	1620	ug/kg	1	-	-	Yes

METHOD: 8270D (SIM)

Naphthalene	31.1	ug/kg	1	-	-	Yes
1,4-Dioxane	15.4	ug/kg	1	-	-	Yes

DATA REVIEW WORKSHEETS

Project Number: JC21036
 Date: May 25, 2016
 Shipping Date: May 25, 2016
 EPA Region: 2

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) Accutest data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: JC21036 Sample matrix: Soil/Groundwater
 No. of Samples: 7_Full_scan/7_SIM

Trip blank No.: -
 Field blank No.: -
 Equipment blank No.: -
 Field duplicate No.: -

<input checked="" type="checkbox"/> Data Completeness	<input checked="" type="checkbox"/> Laboratory Control Spikes
<input checked="" type="checkbox"/> Holding Times	<input checked="" type="checkbox"/> Field Duplicates
<input checked="" type="checkbox"/> GC/MS Tuning	<input checked="" type="checkbox"/> Calibrations
<input checked="" type="checkbox"/> Internal Standard Performance	<input checked="" type="checkbox"/> Compound Identifications
<input checked="" type="checkbox"/> Blanks	<input checked="" type="checkbox"/> Compound Quantitation
<input checked="" type="checkbox"/> Surrogate Recoveries	<input checked="" type="checkbox"/> Quantitation Limits
<input checked="" type="checkbox"/> Matrix Spike/Matrix Spike Duplicate	

Overall Comments: ABN_TCL_list_by_method_SW846-8270D; Naphthalene_and_1,4-Dioxane_
analyzed_by_method_SW846-8270D_(SIM)

Definition of Qualifiers:

J- Estimated results
 U- Compound not detected
 R- Rejected data
 UJ- Estimated nondetect

Reviewer: Rafael Infante
 Date: June 24, 2016

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION

DATE LAB. CONTACTED

DATE RECEIVED

[illegible]

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	pH	ACTION
All samples extracted and analyzed within method recommended holding time. Sample preservation was acceptable.				

Cooler temperature (Criteria: 4 ± 2 °C): 4.1°C

Actions

Results will be qualified based on the criteria of the following Table:

Table 1. Holding Time Actions for Semivolatile Analyses

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 7 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 7 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 7 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R
Non-Aqueous	No	≤ 14 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 14 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 14 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 14 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met see below

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

 X The DFTPP performance results were reviewed and found to be within the specified criteria.

 X DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List _____ the _____ samples _____ affected:

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below _____

INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration: 06/04-05/16 (Scan) _____ 05/17/16 (SIM) _____
 Instrument ID numbers: GCMS3P _____ GCMS3M _____
 Matrix/Level: Aqueous/low _____ Aqueous/low _____

Date of initial calibration: 06/05/2016 (SIM) _____ 05/31/16: 06/06/16 (SIM) _____
 Instrument ID numbers: GCMS4M _____ GCMS4P _____
 Matrix/Level: Aqueous/low _____ Aqueous/low _____

Date of initial calibration: 05/27/2016 (Scan) _____ 04/04-05/16 (Scan) _____
 Instrument ID numbers: GCMSM _____ GCMS4P _____
 Matrix/Level: Aqueous/low _____ Aqueous/low _____

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification meets the method and guidance validation document performance criteria.					

Actions:

Qualify the initial calibration analytes listed in Table 2 using the following criteria:

Table 3. Initial Calibration Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF > Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table 2 for target analyte	J	Use professional judgment
%RSD < Maximum %RSD in Table 2 for target analyte	No qualification	No qualification

DATA REVIEW WORKSHEETS

Initial Calibration

Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatile Analysis

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D ¹	Opening Maximum %D ¹
1,4-Dioxane	0.010	40.0	-40.0	-50.0
Benzaldehyde	0.100	40.0	-40.0	-50.0
Phenol	0.080	20.0	-20.0	-25.0
Bis(2-chloroethyl)ether	0.100	20.0	-20.0	-25.0
2-Chlorophenol	0.200	20.0	-20.0	-25.0
2-Methylphenol	0.010	20.0	-20.0	-25.0
3-Methylphenol	0.010	20.0	-20.0	-25.0
2,2'-(Oxybis-(1-chloropropane))	0.010	20.0	-25.0	-50.0
Acetophenone	0.060	20.0	-20.0	-25.0
4-Methylphenol	0.010	20.0	-20.0	-25.0
N-Nitroso-di-n-propylamine	0.080	20.0	-25.0	-25.0
Hexachloroethane	0.100	20.0	-20.0	-25.0
Nitrobenzene	0.090	20.0	-20.0	-25.0
Isophorone	0.100	20.0	-20.0	-25.0
2-Nitrophenol	0.060	20.0	-20.0	-25.0
2,4-Dimethylphenol	0.050	20.0	-25.0	-50.0
Bis(2-chloroethoxy)methane	0.080	20.0	-20.0	-25.0
2,4-Dichlorophenol	0.060	20.0	-20.0	-25.0
Naphthalene	0.200	20.0	-20.0	-25.0
4-Chloroaniline	0.010	40.0	-40.0	-50.0
Hexachlorobutadiene	0.040	20.0	-20.0	-25.0
Caprolactam	0.010	40.0	-30.0	-50.0
4-Chloro-3-methylphenol	0.040	20.0	-20.0	-25.0
2-Methylnaphthalene	0.100	20.0	-20.0	-25.0
Hexachlorocyclopentadiene	0.010	40.0	-40.0	-50.0
2,4,6-Trichlorophenol	0.090	20.0	-20.0	-25.0
2,4,5-Trichlorophenol	0.100	20.0	-20.0	-25.0
1,1'-Biphenyl	0.200	20.0	-20.0	-25.0

DATA REVIEW WORKSHEETS

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D ¹	Opening Maximum %D ¹
2-Chloronaphthalene	0.300	20.0	- 20.0	- 25.0
2-Nitroaniline	0.060	20.0	- 25.0	- 25.0
Dimethylphthalate	0.300	20.0	- 25.0	- 25.0
2,6-Dinitrotoluene	0.080	20.0	- 20.0	- 25.0
Acenaphthylene	0.400	20.0	- 20.0	- 25.0
3-Nitroaniline	0.010	20.0	- 25.0	- 50.0
Acenaphthene	0.200	20.0	- 20.0	- 25.0
2,4-Dinitrophenol	0.010	40.0	- 50.0	- 50.0
4-Nitrophenol	0.010	40.0	- 40.0	- 50.0
Dibenzofuran	0.300	20.0	- 20.0	- 25.0
2,4-Dinitrotoluene	0.070	20.0	- 20.0	- 25.0
Diethylphthalate	0.300	20.0	- 20.0	- 25.0
1,2,4,5-Tetrachlorobenzene	0.100	20.0	- 20.0	- 25.0
4-Chlorophenyl-phenylether	0.100	20.0	- 20.0	- 25.0
Fluorene	0.200	20.0	- 20.0	- 25.0
4-Nitroaniline	0.010	40.0	- 40.0	- 50.0
4,6-Dinitro-2-methylphenol	0.010	40.0	- 30.0	- 50.0
4-Bromophenyl-phenyl ether	0.070	20.0	- 20.0	- 25.0
N-Nitrosodiphenylamine	0.100	20.0	- 20.0	- 25.0
Hexachlorobenzene	0.050	20.0	- 20.0	- 25.0
Atrazine	0.010	40.0	- 25.0	- 50.0
Pentachlorophenol	0.010	40.0	- 40.0	- 50.0
Phenanthrene	0.200	20.0	- 20.0	- 25.0
Anthracene	0.200	20.0	- 20.0	- 25.0
Carbazole	0.050	20.0	- 20.0	- 25.0
Di-n-butylphthalate	0.500	20.0	- 20.0	- 25.0
Fluoranthene	0.100	20.0	- 20.0	- 25.0
Pyrene	0.400	20.0	- 25.0	- 50.0
Butylbenzylphthalate	0.100	20.0	- 25.0	- 50.0

DATA REVIEW WORKSHEETS

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D ¹	Opening Maximum %D ¹
3,3'-Dichlorobenzidine	0.010	40.0	-40.0	-50.0
Benzo(a)anthracene	0.300	20.0	-20.0	-25.0
Chrysene	0.200	20.0	-20.0	-50.0
Bis(2-ethylhexyl) phthalate	0.200	20.0	-25.0	-50.0
Di-n-octylphthalate	0.010	40.0	-40.0	-50.0
Benzo(b)fluoranthene	0.010	20.0	-25.0	-50.0
Benzo(k)fluoranthene	0.010	20.0	-25.0	-50.0
Benzo(a)pyrene	0.010	20.0	-20.0	-50.0
Indeno(1,2,3-cd)pyrene	0.010	20.0	-25.0	-50.0
Dibenzo(a,h)anthracene	0.010	20.0	-25.0	-50.0
Benzo(g,h,i)perylene	0.010	20.0	-30.0	-50.0
2,3,4,6-Tetrachlorophenol	0.040	20.0	-20.0	-50.0
Naphthalene	0.600	20.0	-25.0	-25.0
2-Methylnaphthalene	0.300	20.0	-20.0	-25.0
Acenaphthylene	0.900	20.0	-20.0	-25.0
Acenaphthene	0.500	20.0	-20.0	-25.0
Fluorene	0.700	20.0	-25.0	-50.0
Phenanthrene	0.300	20.0	-25.0	-50.0
Anthracene	0.400	20.0	-25.0	-50.0
Fluoranthene	0.400	20.0	-25.0	-50.0
Pyrene	0.500	20.0	-30.0	-50.0
Benzo(a)anthracene	0.400	20.0	-25.0	-50.0
Chrysene	0.400	20.0	-25.0	-50.0
Benzo(b)fluoranthene	0.100	20.0	-30.0	-50.0
Benzo(k)fluoranthene	0.100	20.0	-30.0	-50.0
Benzo(a)pyrene	0.100	20.0	-25.0	-50.0
Indeno(1,2,3-cd)pyrene	0.100	20.0	-40.0	-50.0
Dibenzo(a,h)anthracene	0.010	25.0	-40.0	-50.0
Benzo(g,h,i)perylene	0.020	25.0	-40.0	-50.0

DATA REVIEW WORKSHEETS

All criteria were met _____
 Criteria were not met _____
 and/or see below X

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration: 05/13/16; 06/06/16 (SIM)
 Date of initial calibration verification (ICV): 06/01/16; 06/06/16
 Date of continuing calibration verification (CCV): 06/03/16; 06/08/16
 Date of closing CCV: -
 Instrument ID numbers: GCMS4P
 Matrix/Level: Aqueous/low

Date of initial calibration: 06/04-05/16 (Scan) 05/17/16 (SIM)
 Date of initial calibration verification (ICV): 06/05-06/16 05/17-18/16
 Date of closing CCV: -
 Instrument ID numbers: GCMS3P GCMS3M
 Matrix/Level: Aqueous/low Aqueous/low

Date of initial calibration: 05/27/16 (Scan) 04/04-05/16 (Scan)
 Date of initial calibration verification (ICV): 05/27/16 04/05-06/16
 Date of continuing calibration verification (CCV): 05/27/16 05/31/16; 05/31/16; 06/03/16
 Date of closing CCV: -
 Instrument ID numbers: GCMSM GCMSF
 Matrix/Level: Aqueous/low Aqueous/low

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMS4P				
06/01/16	icc879-1.0	-32.8	1,4-dioxane*	
06/03/16	cc879-1.0	-23.1	1,4-dioxane*	JC21036-1; -2
GCMSF				
05/31/16	cc6563-50	-21.9	Acetophenone	JC21036-1MS
		-28.0	n-Nitroso-di-n-propylamine	
		-31.7	2-nitroaniline	
		-32.9	4-nitrophenol*	
		28.6	Benzaldehyde	
05/31/16	cc6563-25	-22.4	phenol	JC21036-1; -2
		-29.8	Acetophenone	
		-25.8	3 + 4-methylphenol	
		-35.0	n-Nitroso-di-n-propylamine	
		-23.3	Nitrobenzene	
		-31.7	2-nitroaniline	
		-40.9	4-nitrophenol	
		-21.4	4,6-dinitro-o-cresol	

DATA REVIEW WORKSHEETS

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMSF				
06/03/16	cc6563-25	22.8	1,4-dioxane*	JC21036-1MSD
		-32.6	Acetophenone	
		-20.3	2-methylphenol	
		-26.3	3 + 4-methylphenol	
		-39.3	n-Nitroso-di-n-propylamine	
		-26.6	Nitrobenzene	
		-26.6	2,4-dimethylphenol	
		-37.2	2-nitroaniline	
		-29.9	4-nitrophenol*	

Note: Initial and continuing calibration verifications meet the method and guidance document required performance criteria except the cases describe in this document.

No closing calibration verification included in data package. No action taken, professional judgment.

* Analytes with % difference in the continue calibration verification outside the method performance criteria but within the validation guidelines criteria, + 40 %. No action taken.

GCMS instrument GCMS3P used in the scan mode for QC samples on 06/10/16. Several analytes missed the % difference criteria. No action taken, QC samples are not validated.

GCMS instrument GCMS4M used in the SIM mode for QC samples on 06/07/16. % difference met the guidance document criteria. QC samples are not validated.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

DATA REVIEW WORKSHEETS

Table 4. CCV Actions for Semivolatile Analysis

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency and sequence	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF > Minimum RRF in Table 2 for target analyte	RRF > Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table 2 for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table 2 for target analyte	No qualification	No qualification

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have an associated field blank.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analytes_detected_in_method_blanks._				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field/trip/equipment_blanks_analyzed_with_this_at_a_package._				

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Qualify samples based on the criteria summarized in Table 5:

Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis

Blank Type	Blank Result	Sample Result	Action
Method, TCLP/SPLP LEB, Field	Detect	Non-detect	No qualification
	< CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		> CRQL	Use professional judgment
	> CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		> CRQL but < Blank Result	Report at sample results and qualify as non-detect (U) or as unusable (R)
		> CRQL and > Blank Result	Use professional judgment
	Grossly high	Detect	Report at sample results and qualify as unusable (R)
	TIC* > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC* > 170 ug/Kg (soil)	Detect	Use professional judgment

List samples qualified

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

Table 7. DMC Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
%R < 10% (excluding DMC's with 10% as a lower acceptance limit)	J-	R
10% ≤ %R (excluding DMC's with 10% as a lower acceptance limit) < Lower Acceptance Limit	J-	UJ
Lower Acceptance limit < %R < Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix: Groundwater/Soil

SAMPLE ID

SURROGATE COMPOUND

ACTION

DMCs meet the required criteria. Non-deuterated surrogates added to the samples were
within laboratory recovery limits.

DATA REVIEW WORKSHEETS

Table 8. Semivolatile DMCs and the Associated Target Analytes

1,4-Dioxane-d ₈ (DMC-1)	Phenol-d ₅ (DMC-2)	Bis(2-Chloroethyl) ether-d ₈ (DMC-3)
1,4-Dioxane	Benzaldehyde Phenol	Bis(2-chloroethyl) ether 2,2'-Oxybis(1-chloropropane) Bis(2-chloroethoxy) methane
2-Chlorophenol-d ₄ (DMC-4)	4-Methylphenol-d ₄ (DMC-5)	4-Chloroaniline-d ₄ (DMC-6)
2-Chlorophenol	2-Methylphenol 3-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	4-Chloroaniline Hexachlorocyclopentadiene Dichlorobenzidine
Nitrobenzene-d ₅ (DMC-7)	2-Nitrophenol-d ₄ (DMC-8)	2,4-Dichlorophenol-d ₃ (DMC-9)
Acetophenone N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,6-Dinitrotoluene 2,4-Dinitrotoluene N-Nitrosodiphenylamine	Isophorone 2-Nitrophenol	2,4-Dichlorophenol Hexachlorobutadiene Hexachlorocyclopentadiene 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 1,2,4,5-Tetrachlorobenzene *Pentachlorophenol 2,3,4,6-Tetrachlorophenol
Dimethylphthalate-d ₈ (DMC-10)	Acenaphthylene-d ₈ (DMC-11)	4-Nitrophenol-d ₄ (DMC-12)
Caprolactam 1,1'-Biphenyl Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	*Naphthalene *2-Methylnaphthalene 2-Chloronaphthalene *Acenaphthylene *Acenaphthene	2-Nitroaniline 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline

DATA REVIEW WORKSHEETS

Fluorene-d ₁₀ (DMC-13)	4,6-Dinitro-2-methylphenol-d ₂ (DMC-14)	Anthracene-d ₁₀ (DMC-15)
Dibenzofuran *Fluorene 4-Chlorophenyl-phenyl ether 4-Bromophenyl-phenyl ether Carbazole	4,6-Dinitro-2-methylphenol	Hexachlorobenzene Atrazine *Phenanthrene *Anthracene
Pyrene-d ₁₀ (DMC-16)	Benzo(a)pyrene-d ₁₂ (DMC-17)	
*Fluoranthene *Pyrene *Benzo(a)anthracene *Chrysene	3,3'-Dichlorobenzidine *Benzo(b)fluoranthene *Benzo(k)fluoranthene *Benzo(a)pyrene *Indeno(1,2,3-cd)pyrene *Dibenzo(a,h)anthracene *Benzo(g,h,i)perylene	

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

Table 9. Semivolatile SIM DMCs and the Associated Target Analytes

Fluoranthene-d10 (DMC-1)	2-Methylnaphthalene-d10 (DMC-2)
Fluoranthene	Naphthalene
Pyrene	2-Methylnaphthalene
Benzo(a)anthracene	Acenaphthylene
Chrysene	Acenaphthene
Benzo(b)fluoranthene	Fluorene
Benzo(k)fluoranthene	Pentachlorophenol
Benzo(a)pyrene	Phenanthrene
Indeno(1,2,3-cd)pyrene	Anthracene
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

DATA REVIEW WORKSHEETS

All criteria were met _____
 Criteria were not met _____
 and/or see below X

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

NOTES: Data for MS and MSDs will not be present unless requested by the Region. Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID: <u>JC21036-3</u>	Matrix/Level: <u>Aqueous</u>
Sample ID: <u>JC21036-1</u>	Matrix/Level: <u>Soil</u>
Sample ID: <u>JC21036-3 (SIM)</u>	Matrix/Level: <u>Aqueous</u>
Sample ID: <u>JC21036-1 (SIM)</u>	Matrix/Level: <u>Soil</u>

The QC reported here applies to the following samples:
 JC21036-3

Method: SW846 8270D

Compound	JC21036-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
Hexachloroethane	ND		105	48.7	46	105	63.6	60	27* a	35-111/26

(a) Outside of in house control limits.

* - outside control limits

Note: No action taken, professional judgment. RPD was outside in house control limits but within generally acceptable control limits. No qualifications made based on RPD.

DATA REVIEW WORKSHEETS

The QC reported here applies to the following samples:
JC21036-1, JC21036-2

Method: SW846 8270D BY SIM

Compound	JC21036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
1,4-Dioxane	ND		40	15.3	38* a	41.3	15.4	37* a	1	50-150/30

(a) Outside in-house control limits.

* Outside control limit.

Note: MS/MSD % recoveries under the lower laboratory control limits. 1,4-dioxane not detected in samples JC21036-1 and JC21036-2. Non-detects are qualified as (R) in affected samples.

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (JJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION
------	-----------	--------	---------	------------------	--------

Internal area meets the required criteria of batch samples corresponding to this data package.

Note: Internal standards were double spiked in two QC samples (method blanks). No action taken, QC samples not validated.

Action:

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
 - a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
 - b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
 - a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
 - b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

DATA REVIEW WORKSHEETS

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

Table 10. Internal Standard Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL	J+	R
20% < Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL	J+	UJ
50% < Area response < 200% of the opening CCV or mid-point standard CS3 from ICAL	No qualification	No qualification
Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL	J-	No qualification
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds	R	R
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds	No qualification	No qualification

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ± 0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration].
Yes? or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
=====	=====	=====
_____	_____	_____
_____	_____	_____
_____	_____	_____

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

- All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
- The relative intensities of these ions must agree within $\pm 20\%$ between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
- Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
=====	=====	=====
_____	_____	_____
_____	_____	_____
_____	_____	_____

Identified compounds meet the required criteria

DATA REVIEW WORKSHEETS

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).
2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.
3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound
=====		=====	

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
 - a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
 - b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).

DATA REVIEW WORKSHEETS

5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples

Criteria	Action	
	Detects	Non-detects
%Solids < 10.0%	Use professional judgment	Use professional judgment
10.0% < %Solids < 30.0%	Use professional judgment	Use professional judgment
%Solids > 30.0%	No qualification	No qualification

SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID: JC21036-3 (Scan) Analyte: Caprolactam RF: 0.134

$$\begin{aligned} [] &= (26115)(40)/(1623945)(0.134) \\ &= 4.8 \text{ ppmOk} \end{aligned}$$

DATA REVIEW WORKSHEETS

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

DATA REVIEW WORKSHEETS

All criteria were met N/A
 Criteria were not met
 and/or see below

FIELD DUPLICATE PRECISION

Sample IDs: -

Matrix: -

Field duplicate samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed as part of this data package. MS/MSD % recoveries RPD used to assess precision. RPD within the required criteria < 50 % for detected target analytes.					

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during sample analysis:

Sample ID	Comments	Actions
=====	=====	=====
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions
=====	=====	=====
_No other issues that required the need to qualify the data. Results are valid and can be used for decision purposes._____		
_____	_____	_____

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).
3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
 - The analysis with the lower CRQL
 - The analysis with the better QC results
 - The analysis with the higher results

EXECUTIVE NARRATIVE

SDG No: **JC21036** Laboratory: **Accutest, Florida**
Analysis: **SW846-8015C** Number of Samples: **7**
Location: **BMSMC, Building 5 Area**
Humacao, PR

SUMMARY: Seven (7) samples were analyzed for the low molecular weight alcohols (LMWAs) list following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings: **None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: **Rafael Infante**
Chemist License 1888

Signature:

A handwritten signature in blue ink, reading "Rafael Infante", is written over a horizontal line.

Date: **June 24, 2016**

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC21036-1

Sample location: BMSMC Building 5 Area

Sampling date: 5/25/2016

Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	250	ug/kg	1.0	-	U	Yes

Sample ID: JC21036-2

Sample location: BMSMC Building 5 Area

Sampling date: 5/25/2016

Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	120	ug/kg	1.0	-	U	Yes
Isobutyl Alcohol	120	ug/kg	1.0	-	U	Yes
Isopropyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Propyl Alcohol	120	ug/kg	1.0	-	U	Yes
n-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
sec-Butyl Alcohol	120	ug/kg	1.0	-	U	Yes
Methanol	240	ug/kg	1.0	-	U	Yes

Sample ID: JC21036-3

Sample location: BMSMC Building 5 Area

Sampling date: 5/25/2016

Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	100	ug/l	1.0	-	U	Yes
Isobutyl Alcohol	100	ug/l	1.0	-	U	Yes
Isopropyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Propyl Alcohol	100	ug/l	1.0	-	U	Yes
n-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
sec-Butyl Alcohol	100	ug/l	1.0	-	U	Yes
Methanol	200	ug/l	1.0	-	U	Yes

Sample ID: JC21036-3MS
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	5330	ug/l	1.0	-	-	Yes
Isobutyl Alcohol	5200	ug/l	1.0	-	-	Yes
Isopropyl Alcohol	5340	ug/l	1.0	-	-	Yes
n-Propyl Alcohol	5330	ug/l	1.0	-	-	Yes
n-Butyl Alcohol	4990	ug/l	1.0	-	-	Yes
sec-Butyl Alcohol	5160	ug/l	1.0	-	-	Yes
Methanol	5120	ug/l	1.0	-	-	Yes

Sample ID: JC21036-3MSD
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Groundwater

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	4560	ug/l	1.0	-	-	Yes
Isobutyl Alcohol	5250	ug/l	1.0	-	-	Yes
Isopropyl Alcohol	4730	ug/l	1.0	-	-	Yes
n-Propyl Alcohol	5100	ug/l	1.0	-	-	Yes
n-Butyl Alcohol	5480	ug/l	1.0	-	-	Yes
sec-Butyl Alcohol	4880	ug/l	1.0	-	-	Yes
Methanol	4750	ug/l	1.0	-	-	Yes

Sample ID: JC21036-1MS
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	6210	ug/kg	1.0	-	-	Yes
Isobutyl Alcohol	5850	ug/kg	1.0	-	-	Yes
Isopropyl Alcohol	6070	ug/kg	1.0	-	-	Yes
n-Propyl Alcohol	6350	ug/kg	1.0	-	-	Yes
n-Butyl Alcohol	5380	ug/kg	1.0	-	-	Yes
sec-Butyl Alcohol	6190	ug/kg	1.0	-	-	Yes
Methanol	6410	ug/kg	1.0	-	-	Yes

Sample ID: JC21036-1MSD
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: Soil

METHOD: 8015C

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Ethanol	6430	ug/kg	1.0	-	-	Yes
Isobutyl Alcohol	6200	ug/kg	1.0	-	-	Yes
Isopropyl Alcohol	6330	ug/kg	1.0	-	-	Yes
n-Propyl Alcohol	6590	ug/kg	1.0	-	-	Yes
n-Butyl Alcohol	5610	ug/kg	1.0	-	-	Yes
sec-Butyl Alcohol	6400	ug/kg	1.0	-	-	Yes
Methanol	6570	ug/kg	1.0	-	-	Yes

DATA REVIEW WORKSHEETS

Project Number: JC21036
 Date: 05/25/2016
 Shipping Date: 05/25/2016
 EPA Region: 2

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) Accutest data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: JC21036 Sample matrix: SoilGroundwater
 No. of Samples: 7

Trip blank No.: -
 Field blank No.: -
 Equipment blank No.: -
 Field duplicate No.: -

<input checked="" type="checkbox"/> Data Completeness	<input checked="" type="checkbox"/> Laboratory Control Spikes
<input checked="" type="checkbox"/> Holding Times	<input checked="" type="checkbox"/> Field Duplicates
<input type="checkbox"/> N/A GC/MS Tuning	<input checked="" type="checkbox"/> Calibrations
<input type="checkbox"/> N/A Internal Standard Performance	<input checked="" type="checkbox"/> Compound Identifications
<input checked="" type="checkbox"/> Blanks	<input checked="" type="checkbox"/> Compound Quantitation
<input checked="" type="checkbox"/> Surrogate Recoveries	<input checked="" type="checkbox"/> Quantitation Limits
<input checked="" type="checkbox"/> Matrix Spike/Matrix Spike Duplicate	

Overall Comments: Low_molecular_weight_alcohols_by_SW-846_8015C

Definition of Qualifiers:

J- Estimated results
 U- Compound not detected
 R- Rejected data
 UJ- Estimated nondetect

Reviewer: Rafael Infante
 Date: June 24, 2016

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION

DATE LAB. CONTACTED

DATE RECEIVED

[illegible]

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time. All samples properly preserved.				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH ≤ 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.

Soil samples- 7 days from sample collection.

Cooler temperature (Criteria: 4 ± 2 °C): 4.1°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

DATA REVIEW WORKSHEETS

All criteria were met __N/A__
Criteria were not met see below

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A__ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A__ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

DATA REVIEW WORKSHEETS

All criteria were met ☒
 Criteria were not met
 and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration: 05/17/16
 Dates of continuing calibration: 05/17/16 (initial); 05/27/16
 Dates of final calibration verification: 05/27/16
 Instrument ID number: GCGH
 Matrix/Level: Aqueous/low

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Note: Initial, continuing, and final calibration verifications meets method specific criteria in the two columns.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be $\leq 15\%$ regardless of method requirements for CCC.

All %Ds must be $\leq 20\%$ regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05 , estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD $> 15\%$, estimate positive results (J) and use professional judgment to qualify nondetects.

If any compound has a %RSD $> 90\%$, estimate positive results (J) and reject nondetects (R).

If any compound has a % D $> 20\%$, estimate positive results (J) and reject nondetects (R).

If any compound has a % D $> 20\%$, estimate positive results (J) and nondetects (UJ).

If any compound has a % D $> 90\%$, estimate positive results (J) and reject nondetects (R).

If any compound has $r < 0.995$, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

[illegible]

DATA REVIEW WORKSHEETS

All criteria were met ☒
 Criteria were not met
 and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
 ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \leq AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is \geq SQL and $>$ AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately

Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

DATA REVIEW WORKSHEETS

All criteria were met ☒
 Criteria were not met
 and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	DBFM	TOL-d8	BFB	

All surrogate recoveries within laboratory control limits. _____

QC Limits* (Aqueous)

LL to UL 73 to 123 to to to

QC Limits* (Solid-Low)

LL to UL 69 to 121 to to to

QC Limits* (Solid-Med)

LL to UL to to to to

1,2-DCA = 1,2-Dichloromethane-d4

TOL-d8 = Toluene-d8

DBFM = Dibromofluoromethane

BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.

* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
 If any one surrogate in a fraction shows < 10 % recovery.

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID: JC21036-3MS/-MSD Matrix/Level: Groundwater/low
 Sample ID: JC21036-1MS/-MSD Matrix/Level: Soil/low

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
<u> MS/MSD % recoveries and RPD within laboratory control limits. </u>					

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID: _____ - _____ Matrix/Level/Unit: _____ - _____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION
----------	-----------------	----------	-----------	-------	--------

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

A separate worksheet should be used for each MS/MSD pair.

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes**
 or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT
<u>Recoveries within laboratory control limits.</u>			

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).

If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

DATA REVIEW WORKSHEETS

All criteria were met N/A
 Criteria were not met
 and/or see below

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: -

Matrix: -

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. MS/MSD % recoveries RPD used to assess precision. RPD within laboratory, generally acceptable and guidance document performance criteria control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

DATA REVIEW WORKSHEETS

All criteria were met N/A
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION
------	-----------	--------	---------	------------------	--------

[illegible]

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO - 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC21036-1MS

n-Butanol

RF = 28.56

$$[] = (144864)/(28.56)$$

$$= 5,072 \text{ ppm OK}$$

1. 1.

All criteria were met X
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

[illegible]

B. Percent Solids

List samples which have $\leq 50\%$ solids

[illegible]

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is $< 10\%$, estimate positive results (J) and reject nondetects (R)

EXECUTIVE NARRATIVE

SDG No: **JC21036** Laboratory: **Accutest, New Jersey**
Analysis: **SW846-8081B** Number of Samples: **7**

Location: **BMSMC, Building 5 Area**
Humacao, PR

SUMMARY: Seven (7) samples were analyzed for selected pesticides following method SW846-8081B. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings: **None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: **Rafael Infante**
Chemist License 1888

Signature:

A handwritten signature in blue ink, appearing to read 'Rafael Infante', is written over a horizontal line.

Date: **June 24, 2016**

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC21036-1

Sample location: BMSMC Building 5 Area

Sampling date: 25-May-16

Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.80	ug/kg	1	-	U	Yes
alpha-BHC	0.80	ug/kg	1	-	U	Yes
beta-BHC	0.80	ug/kg	1	-	U	Yes
delta-BHC	0.80	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.80	ug/kg	1	-	U	Yes
alpha-Chlordane	0.80	ug/kg	1	-	U	Yes
gamma-Chlordane	0.80	ug/kg	1	-	U	Yes
Dieldrin	0.80	ug/kg	1	-	U	Yes
4,4'-DDD	0.80	ug/kg	1	-	U	Yes
4,4'-DDE	0.80	ug/kg	1	-	U	Yes
4,4'-DDT	0.80	ug/kg	1	-	U	Yes
Endrin	0.80	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.80	ug/kg	1	-	U	Yes
Endrin aldehyde	0.80	ug/kg	1	-	U	Yes
Endosulfan-I	0.80	ug/kg	1	-	U	Yes
Endosulfan-II	0.80	ug/kg	1	-	U	Yes
Heptachlor	0.80	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.80	ug/kg	1	-	U	Yes
Methoxychlor	1.6	ug/kg	1	-	U	Yes
Endrin ketone	0.80	ug/kg	1	-	U	Yes
Toxaphene	20	ug/kg	1	-	U	Yes

Sample ID: JC21036-2
Sample location: BMSMC Building 5 Area
Sampling date: 25-May-16
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.77	ug/kg	1	-	U	Yes
alpha-BHC	0.77	ug/kg	1	-	U	Yes
beta-BHC	0.77	ug/kg	1	-	U	Yes
delta-BHC	0.77	ug/kg	1	-	U	Yes
gamma-BHC (Lindane)	0.77	ug/kg	1	-	U	Yes
alpha-Chlordane	0.77	ug/kg	1	-	U	Yes
gamma-Chlordane	0.77	ug/kg	1	-	U	Yes
Dieldrin	0.77	ug/kg	1	-	U	Yes
4,4'-DDD	0.77	ug/kg	1	-	U	Yes
4,4'-DDE	0.77	ug/kg	1	-	U	Yes
4,4'-DDT	0.77	ug/kg	1	-	U	Yes
Endrin	0.77	ug/kg	1	-	U	Yes
Endosulfan sulfate	0.77	ug/kg	1	-	U	Yes
Endrin aldehyde	0.77	ug/kg	1	-	U	Yes
Endosulfan-I	0.77	ug/kg	1	-	U	Yes
Endosulfan-II	0.77	ug/kg	1	-	U	Yes
Heptachlor	0.77	ug/kg	1	-	U	Yes
Heptachlor epoxide	0.77	ug/kg	1	-	U	Yes
Methoxychlor	1.5	ug/kg	1	-	U	Yes
Endrin ketone	0.77	ug/kg	1	-	U	Yes
Toxaphene	19	ug/kg	1	-	U	Yes

Sample ID: JC21036-3
Sample location: BMSMC Building 5 Area
Sampling date: 25-May-16
Matrix: Groundwater

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.011	ug/L	1	-	U	Yes
alpha-BHC	0.011	ug/L	1	-	U	Yes
beta-BHC	0.011	ug/L	1	-	U	Yes
delta-BHC	0.011	ug/L	1	-	U	Yes
gamma-BHC (Lindane)	0.011	ug/L	1	-	U	Yes
alpha-Chlordane	0.011	ug/L	1	-	U	Yes
gamma-Chlordane	0.011	ug/L	1	-	U	Yes
Dieldrin	0.011	ug/L	1	-	U	Yes
4,4'-DDD	0.011	ug/L	1	-	U	Yes
4,4'-DDE	0.011	ug/L	1	-	U	Yes
4,4'-DDT	0.011	ug/L	1	-	U	Yes
Endrin	0.011	ug/L	1	-	U	Yes
Endosulfan sulfate	0.011	ug/L	1	-	U	Yes
Endrin aldehyde	0.011	ug/L	1	-	U	Yes
Endrin ketone	0.011	ug/L	1	-	U	Yes
Endosulfan-I	0.011	ug/L	1	-	U	Yes
Endosulfan-II	0.011	ug/L	1	-	U	Yes
Heptachlor	0.011	ug/L	1	-	U	Yes
Heptachlor epoxide	0.011	ug/L	1	-	U	Yes
Methoxychlor	0.022	ug/L	1	-	U	Yes
Toxaphene	0.28	ug/L	1	-	U	Yes

Sample ID: JC21036-3MS
Sample location: BMSMC Building 5 Area
Sampling date: 25-May-16
Matrix: Groundwater

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.29	ug/L	1	-	-	Yes
alpha-BHC	0.27	ug/L	1	-	-	Yes
beta-BHC	0.28	ug/L	1	-	-	Yes
delta-BHC	0.32	ug/L	1	-	-	Yes
gamma-BHC (Lindane)	0.29	ug/L	1	-	-	Yes
alpha-Chlordane	0.30	ug/L	1	-	-	Yes
gamma-Chlordane	0.29	ug/L	1	-	-	Yes
Dieldrin	0.30	ug/L	1	-	-	Yes
4,4'-DDD	0.27	ug/L	1	-	-	Yes
4,4'-DDE	0.30	ug/L	1	-	-	Yes
4,4'-DDT	0.31	ug/L	1	-	-	Yes
Endrin	0.23	ug/L	1	-	-	Yes
Endosulfan sulfate	0.29	ug/L	1	-	-	Yes
Endrin aldehyde	0.23	ug/L	1	-	-	Yes
Endrin ketone	0.30	ug/L	1	-	-	Yes
Endosulfan-I	0.29	ug/L	1	-	-	Yes
Endosulfan-II	0.31	ug/L	1	-	-	Yes
Heptachlor	0.22	ug/L	1	-	-	Yes
Heptachlor epoxide	0.27	ug/L	1	-	-	Yes
Methoxychlor	0.30	ug/L	1	-	-	Yes
Toxaphene	ND	ug/L				Yes

Sample ID: JC21036-3MSD
Sample location: BMSMC Building 5 Area
Sampling date: 25-May-16
Matrix: Groundwater

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	0.30	ug/L	1	-	-	Yes
alpha-BHC	0.28	ug/L	1	-	-	Yes
beta-BHC	0.29	ug/L	1	-	-	Yes
delta-BHC	0.33	ug/L	1	-	-	Yes
gamma-BHC (Lindane)	0.31	ug/L	1	-	-	Yes
alpha-Chlordane	0.31	ug/L	1	-	-	Yes
gamma-Chlordane	0.29	ug/L	1	-	-	Yes
Dieldrin	0.29	ug/L	1	-	-	Yes
4,4'-DDD	0.28	ug/L	1	-	-	Yes
4,4'-DDE	0.30	ug/L	1	-	-	Yes
4,4'-DDT	0.30	ug/L	1	-	-	Yes
Endrin	0.27	ug/L	1	-	-	Yes
Endosulfan sulfate	0.30	ug/L	1	-	-	Yes
Endrin aldehyde	0.23	ug/L	1	-	-	Yes
Endrin ketone	0.31	ug/L	1	-	-	Yes
Endosulfan-I	0.29	ug/L	1	-	-	Yes
Endosulfan-II	0.31	ug/L	1	-	-	Yes
Heptachlor	0.23	ug/L	1	-	-	Yes
Heptachlor epoxide	0.27	ug/L	1	-	-	Yes
Methoxychlor	0.31	ug/L	1	-	-	Yes
Toxaphene	ND	ug/L				Yes

Sample ID: JC21036-1MS
Sample location: BMSMC Building 5 Area
Sampling date: 25-May-16
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	24.9	ug/kg	1	-	-	Yes
alpha-BHC	24.8	ug/kg	1	-	-	Yes
beta-BHC	21.2	ug/kg	1	-	-	Yes
delta-BHC	25.2	ug/kg	1	-	-	Yes
gamma-BHC (Lindane)	20.8	ug/kg	1	-	-	Yes
alpha-Chlordane	23.6	ug/kg	1	-	-	Yes
gamma-Chlordane	24.6	ug/kg	1	-	-	Yes
Dieldrin	24.1	ug/kg	1	-	-	Yes
4,4'-DDD	23.9	ug/kg	1	-	-	Yes
4,4'-DDE	25.8	ug/kg	1	-	-	Yes
4,4'-DDT	22.5	ug/kg	1	-	-	Yes
Endrin	24.1	ug/kg	1	-	-	Yes
Endosulfan sulfate	22.8	ug/kg	1	-	-	Yes
Endrin aldehyde	22.0	ug/kg	1	-	-	Yes
Endosulfan-I	22.0	ug/kg	1	-	-	Yes
Endosulfan-II	23.6	ug/kg	1	-	-	Yes
Heptachlor	24.2	ug/kg	1	-	-	Yes
Heptachlor epoxide	22.2	ug/kg	1	-	-	Yes
Methoxychlor	22.2	ug/kg	1	-	-	Yes
Endrin ketone	23.5	ug/kg	1	-	-	Yes
Toxaphene	ND	ug/kg				

Sample ID: JC21036-1MSD
Sample location: BMSMC Building 5 Area
Sampling date: 25-May-16
Matrix: Soil

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Aldrin	25.1	ug/kg	1	-	-	Yes
alpha-BHC	25.0	ug/kg	1	-	-	Yes
beta-BHC	20.5	ug/kg	1	-	-	Yes
delta-BHC	24.8	ug/kg	1	-	-	Yes
gamma-BHC (Lindane)	20.7	ug/kg	1	-	-	Yes
alpha-Chlordane	23.1	ug/kg	1	-	-	Yes
gamma-Chlordane	24.1	ug/kg	1	-	-	Yes
Dieldrin	24.1	ug/kg	1	-	-	Yes
4,4'-DDD	23.3	ug/kg	1	-	-	Yes
4,4'-DDE	25.0	ug/kg	1	-	-	Yes
4,4'-DDT	21.9	ug/kg	1	-	-	Yes
Endrin	23.5	ug/kg	1	-	-	Yes
Endosulfan sulfate	22.1	ug/kg	1	-	-	Yes
Endrin aldehyde	20.7	ug/kg	1	-	-	Yes
Endosulfan-I	21.4	ug/kg	1	-	-	Yes
Endosulfan-II	23.1	ug/kg	1	-	-	Yes
Heptachlor	24.6	ug/kg	1	-	-	Yes
Heptachlor epoxide	21.8	ug/kg	1	-	-	Yes
Methoxychlor	21.8	ug/kg	1	-	-	Yes
Endrin ketone	23.0	ug/kg	1	-	-	Yes
Toxaphene	ND	ug/kg				

DATA REVIEW WORKSHEETS

Project/Case Number: JC21036
 Sampling Date: May 25, 2016
 Shipping Date: May 25, 2016
 EPA Region No.: 2

REVIEW OF PESTICIDE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) Accutest data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: JC21036 Sample matrix: Soil/Groundwater
 No. of Samples: 7
 Trip blank No.: -
 Field blank No.: -
 Equipment blank No.: -
 Field duplicate No.: -
 Field spikes No.: -
 QC audit samples: -

<input checked="" type="checkbox"/> Data Completeness	<input checked="" type="checkbox"/> Laboratory Control Spikes
<input checked="" type="checkbox"/> Holding Times	<input checked="" type="checkbox"/> Field Duplicates
<u>N/A</u> GC/MS Tuning	<input checked="" type="checkbox"/> Calibrations
<input checked="" type="checkbox"/> Internal Standard Performance	<input checked="" type="checkbox"/> Compound Identifications
<input checked="" type="checkbox"/> Blanks	<input checked="" type="checkbox"/> Compound Quantitation
<input checked="" type="checkbox"/> Surrogate Recoveries	<input checked="" type="checkbox"/> Quantitation Limits
<input checked="" type="checkbox"/> Matrix Spike/Matrix Spike Duplicate	

Overall Comments: TCL_pesticides_list_by_SW846-8081B

Definition of Qualifiers:

J- Estimated results
 U- Compound not detected
 R- Rejected data
 UJ- Estimated nondetect

Reviewer: Rafael Hunt
 Date: June 24, 2016

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION

DATE LAB. CONTACTED

DATE RECEIVED

[illegible]

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	ACTION
Samples properly preserved.			

Preservatives: All samples extracted and analyzed within the required criteria.

Criteria

Aqueous samples - seven (7) days from sample collection for extraction; 40 days from sample collection for analysis.

Non-aqueous samples – fourteen (14) days from sample collection for extraction; 40 days from sample collection for analysis.

Cooler temperature (Criteria: 4 ± 2 °C): 4.1°C - OK

Actions

Qualify aqueous sample results using preservation and technical holding time information as follows:

- If there is no evidence that the samples were properly preserved ($T = 4^{\circ}\text{C} \pm 2^{\circ}\text{C}$), and the samples were extracted or analyzed within the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).
- If there is no evidence that the samples were properly preserved ($T = 4^{\circ}\text{C} \pm 2^{\circ}\text{C}$), and the samples were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).
- If the samples were properly preserved, and were extracted and analyzed within the technical holding times, no qualification of the data is necessary.
- If the samples were properly preserved, and were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.

DATA REVIEW WORKSHEETS

- e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
- f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

Qualify non-aqueous sample results using preservation and technical holding time information as follows:

- a. If there is no evidence that the samples were properly preserved ($T = 4^{\circ}\text{C} \pm 2^{\circ}\text{C}$), and the samples were extracted or analyzed within the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
- b. If there is no evidence that the samples were properly preserved ($T = 4^{\circ}\text{C} \pm 2^{\circ}\text{C}$), and the samples were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
- c. If the samples were properly preserved, and were extracted and analyzed within the technical holding time, no qualification of the data is necessary.
- d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.
- e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
- f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met see below

GAS CHROMATOGRAPH WITH ELECTRON CAPTURE DETECTOR (GC/ECD) INSTRUMENT PERFORMANCE CHECK (SECTIONS 1 TO 5)

1. Resolution Check Mixture

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? Yes? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 60.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

- a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
- b. Qualify non-detected compounds as unusable (R).

2. Performance Evaluation Mixture (PEM) Resolution Criteria

Criteria

Is PEM analysis performed at the required frequency (at the end of each pesticide initial calibration sequence and every 12 hours)? Yes? or No?

Action

- a. If PEM is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

Criteria

Is PEM % Resolution < 90%? Yes? or No?

Action

- a. a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
- b. Qualify non-detected compounds as unusable (R).

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met see below

3. PEM 4,4'-DDT Breakdown

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or No?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or No?

Action

- a. Qualify non-detects for 4,4'- DDT as unusable (R)
- b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
- c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

4. PEM Endrin Breakdown

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or No?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or No?

Action

- a. Qualify non-detects for Endrin as unusable (R)
- b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
- c. Qualify detects for Endrin ketone as tentatively identified (NJ)

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met see below

5. Mid-point Individual Standard Mixture Resolution -

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? Yes? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 90.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

- a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
- b. Qualify non-detected compounds as unusable (R).

Criteria

Is mid-point individual standard mixture analysis performed at the required frequency (every 12 hours)? Yes? or No?

Action

- a. If the mid-point individual standard mixture analysis is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration: 05/24/16; 05/27/16
 Dates of initial calibration verification: 05/24/16; 05/27/16
 Dates of continuing calibration: 05/27/16
 Dates of final calibration: 05/27/16
 Instrument ID numbers: GC4G
 Matrix/Level: Aqueous/low

Date of initial calibration: 05/27/16
 Dates of initial calibration verification: 05/27/16
 Dates of continuing calibration: 05/31/16; 06/03/16
 Dates of final calibration: 05/31/16; 06/03/16
 Instrument ID numbers: HP_G1530A
 Matrix/Level: Aqueous/low

DATE	LAB ID#	FILE	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in at least one of the two columns. Final calibration verification included in data. % differences meet the performance criteria in at least one of the two columns.					

Criteria

Are a five point calibration curve delivered with concentration levels as shown in Table 3 of SOP HW-36A, Revision 0, June, 2015? Yes? or No?

Actions

If the standard concentrations listed in Table 3 are not used, use professional judgment to evaluate the effect on the data

Criteria

Are RT Windows calculated correctly? Yes? or No?

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below

Action

Recalculate the windows and use the corrected values for all evaluations.

Criteria

Are the Percent Relative Standard Deviation (%RSD) of the CFs for each of the single component target compounds less than or equal to 20.0%, except for alpha-BHC and delta-BHC?

Yes? or No?

Are the %RSD of the CFs for alpha-BHC and delta-BHC less than or equal to 25.0%. Yes? or No?

Is the %RSD of the CFs for each of the Toxaphene peaks must be < 30% when 5-point ICAL is performed?

Yes? or No?

Is the %RSD of the CFs for the two surrogates (tetrachloro-m-xylene and decachlorobiphenyl) less than or equal to 30.0%.

Yes? or No?

Action

- If the %RSD criteria are not met, qualify detects as estimated (J) and use professional judgment to qualify non-detected target compounds.
- If the %RSD criteria are within allowable limits, no qualification of the data is necessary

Continuing Calibration Checks

Criteria

Is the continuing calibration standard analyzed at the acceptable time intervals? Yes? or No?

Action

- If more than 14 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of either a PEM or mid-point concentration of the Individual Standard Mixtures (A and B) or (C), qualify all data as unusable (R).
- If more than 12 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of the last sample or blank that is part of the same analytical sequence, qualify all data as unusable (R).
- If more than 72 hours has elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene Calibration Verification Standard (CS3), qualify all data as unusable (R).

Criteria

Is the Percent Difference (%D) within $\pm 25.0\%$ for the PEM sample?

Yes? or No?

Action

- Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

DATA REVIEW WORKSHEETS

Criteria

For the Calibration Verification Standard (CS3); is the Percent Difference (%D) within $\pm 25.0\%$?
Yes? or No?

Action

Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

Is the PEM 4,4'-DDT % Breakdown $>20.0\%$ and 4,4'-DDT is detected? Yes? or No?

Action

- a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)
- b. Non-detected associated compounds are not qualified

Criteria

Is the PEM 4,4'-DDT % Breakdown $>20.0\%$ and 4,4'-DDT is not detected Yes? or No?

Action

- a. Qualify non-detects for 4,4'- DDT as unusable (R)
- b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
- c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

Criteria

Is the PEM Endrin % Breakdown $>20.0\%$ and Endrin is detected? Yes? or No?

Action

- a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)
- b. Non-detected associated compounds are not qualified

Criteria

Is the PEM Endrin % Breakdown $>20.0\%$ and Endrin is not detected Yes? or No?

Action

- a. Qualify non-detects for Endrin as unusable (R)
- b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
- c. Qualify detects for Endrin ketone as tentatively identified (NJ)

A separate worksheet should be filled for each initial curve

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

CRQL concentration N/A

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
---------------	--------	---------------	----------	---------------------

No target analytes detected in method blanks at a reporting limit of 0.01 and 0.001 ug/L.

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
---------------	--------	---------------	----------	---------------------

No field/trip/equipment blanks analyzed with this data package.

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

The concentration of non-target compounds in all blanks must be less than or equal to 10 µg/L. The concentration of each target compound found in the method or field blanks must be less than its CRQL listed in the method.

Data concerning the field blanks are not evaluated as part of the CCS process. If field blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

Specific actions are as follows:

Blank Actions for Pesticide Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Sulfur Cleanup, Instrument, Field, TCLP/SPLP	Detects	Not detected	No qualification required
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL and > blank concentration	No qualification required
	= CRQL	≤ CRQL	Report CRQL value with a U
		> CRQL	No qualification required
	Gross contamination	Detects	Report blank value for sample concentration with a U

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below _____

[illegible]

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix: Aqueous

Lab	Lab				
Sample ID	File ID	S1 a	S1 b	S2 a	S2 b
JC21036-3	4G68705.D	69	56	66	57
OP94316-BS1	4G68694.D	62	59	67	62
OP94316-MB1	4G68693.D	82	81	94	87
OP94316-MS	4G68706.D	85	73	66	57
OP94316-MSD	4G68707.D	90	73	80	65

Surrogate Compounds Recovery Limits

S1 = Tetrachloro-m-xylene 26-132%

S2 = Decachlorobiphenyl 10-118%

(a) Recovery from GC signal #1

(b) Recovery from GC signal #2

Note: Surrogate recoveries within laboratory control limits.

Matrix: Soil

Lab	Lab				
Sample ID	File ID	S1 a	S1 b	S2 a	S2 b
JC21036-1	6G35639.D	108	104	109	113
JC21036-2	6G35642.D	79	79	83	89
OP94338-BS1	6G35636.D	104	102	110	117
OP94338-MB1	6G35635.D	100	98	105	108
OP94338-MB1	6G35798.D	98	97	108	126
OP94338-MS	6G35640.D	105	100	107	112
OP94338-MSD	6G35641.D	100	97	104	110

Surrogate Compounds Recovery Limits

S1 = Tetrachloro-m-xylene 24-136%

S2 = Decachlorobiphenyl 10-153%

(a) Recovery from GC signal #1

(b) Recovery from GC signal #2

Note: Surrogate recoveries within laboratory control limits.

DATA REVIEW WORKSHEETS

Actions:

- a. For any surrogate recovery greater than 150%, qualify detected target compounds as biased high (J+).
- b. Do not qualify non-detected target compounds for surrogate recovery > 150 %.
- c. If both surrogate recoveries are greater than or equal to 30% and less than or equal to 150%, no qualification of the data is necessary.
- d. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify detected target compounds as biased low (J-).
- e. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify non-detected target compounds as approximated (UJ).
- f. If low surrogate recoveries are from sample dilution, professional judgment should be used to determine if the resulting data should be qualified. If sample dilution is not a factor:
 - i. Qualify detected target compounds as biased low (J-).
 - ii. Qualify non-detected target compounds as unusable (R).
- g. If surrogate RTs in PEMs, Individual Standard Mixtures, samples, and blanks are outside of the RT Windows, the reviewer must use professional judgment to qualify data.
- h. If surrogate RTs are within RT windows, no qualification of the data is necessary.
- i. If the two surrogates were not added to all samples, MS/MSDs, standards, LCSs, and blanks, use professional judgment in qualifying data as missing surrogate analyte may not directly apply to target analytes.

Summary Surrogate Actions for Pesticide Analyses

Criteria	Action*	
	Detected Target Compounds	Non-detected Target Compounds
%R > 150%	J+	No qualification
30% < %R < 150%	No qualification	
10% < %R < 30%	J-	UJ
%R < 10% (sample dilution not a factor)	J-	R
%R < 10% (sample dilution is a factor)	Use professional judgment	
RT out of RT window	Use professional judgment	
RT within RT window	No qualification	

- * Use professional judgment in qualifying data, as surrogate recovery problems may not directly apply to target analytes.

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met _____
 and/or see below _____

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

Data for MS and MSDs will not be present unless requested by the Region.

Notify the Contract Laboratory Program Project Officer (CLP PO) if a field blank was used for the MS and MSD, unless designated as such by the Region.

NOTE: For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID: JC21036-3MS/MSD

Matrix/Level: Groundwater

Sample ID: JC21036-1MS/MSD

Matrix/Level: Soil

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION

Note: MS/MSD sample analyzed with this data package. % recoveries and RPD within laboratory control limits.

Action

No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

A separate worksheet should be used for each MS/MSD pair.

DATA REVIEW WORKSHEETS

All criteria were met ☒
 Criteria were not met
 and/or see below _____

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

LCS Spike Compound	Recovery Limits (%)
gamma-BHC	50 – 120
Heptachlor epoxide	50 – 150
Dieldrin	30 – 130
4,4'-DDE	50 – 150
Endrin	50 – 120
Endosulfan sulfate	50 – 120
trans-Chlordane	30 – 130
Tetrachloro-m-xylene (surrogate)	30 – 150
Decachlorobiphenyl (surrogate)	30 – 150

LCS
 concentrations: _____ 0.25 ug/l; _____ 16.7 ug/kg _____

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Action

The following guidance is suggested for qualifying sample data for which the associated LCS does not meet the required criteria.

- If the LCS recovery exceeds the upper acceptance limit, qualify detected target compounds as estimated (J). Do not qualify non-detected target compounds.
- If the LCS recovery is less than the lower acceptance limit, qualify detected target compounds as estimated (J) and non-detects as unusable (R).
- Use professional judgment to qualify data for compounds other than those compounds that are included in the LCS.
- Use professional judgment to qualify non-LCS compounds. Take into account the compound class, compound recovery efficiency, analytical problems associated with each compound, and comparability in the performance of the LCS compound to the non-LCS compound.
- If the LCS recovery is within allowable limits, no qualification of the data is necessary.

DATA REVIEW WORKSHEETS

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

Note: Blank spike/blank spike duplicate analyzed for aqueous and soil matrices. % recoveries and RPD within laboratory control limits.

DATA REVIEW WORKSHEETS

All criteria were met _____
Criteria were not met _____
and/or see below N/A

FLORISIL CARTRIDGE PERFORMANCE CHECK

NOTE: Florisil cartridge cleanup is mandatory for all extracts.

Criteria

Is the Florisil cartridge performance check conducted at least once on each lot of cartridges used for sample cleanup or every 6 months, whichever is most frequent? Yes? or No?

Criteria

Are the results for the Florisil Cartridge Performance Check solution included with the data package? Yes? or No?

Note: If % criteria are not met, examine the raw data for the presence of polar interferences and use professional judgment in qualifying the data as follows:

Action:

- a. If the Percent Recovery is greater than 120% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.
- b. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
- c. If the Percent Recovery is greater than or equal to 10% and less than 80% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
- d. If the Percent Recovery is less than 10% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J) and qualify non-detected target compounds as unusable (R).
- e. If the Percent Recovery of 2,4,5-trichlorophenol in the Florisil Cartridge Performance Check is greater than or equal to 5%, use professional judgment to qualify detected and non-detected target compounds, considering interference on the sample chromatogram.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the Florisil Cartridge Performance Check analysis not yielding acceptable results.

Note: No information for florisil cartridge performance check included in data package. There is evidence that Florisil cartridge was used for sample extraction/clean-up. No qualification of the data performed, professional judgment.

DATA REVIEW WORKSHEETS

All criteria were met N/A
Criteria were not met
and/or see below _____

GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

NOTE: GPC cleanup is mandatory for all soil samples.

If GPC criteria are not met, examine the raw data for the presence of high molecular weight contaminants; examine subsequent sample data for unusual peaks; and use professional judgment in qualifying the data. Notify the Contract Laboratory Program Project Officer (CLP PO) if the laboratory chooses to analyze samples under unacceptable GPC criteria.

Action:

- a. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, the non-detected target compounds may be suspect, qualify detected compounds as estimated (J).
- b. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, qualify all non-detected target compounds as unusable (R).
- c. If the Percent Recovery is greater than or equal to 10% and is less than 80% for any of the pesticide target compounds in the GPC calibration, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
- d. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
- e. If high recoveries (i.e., greater than 120%) were obtained for the pesticides and surrogates during the GPC calibration check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the GPC cleanup analyses not yielding acceptable results.

Note: No information for performance of GPC cleanup included in data package. No qualification of the data performed, professional judgment.

DATA REVIEW WORKSHEETS

All criteria were met X
Criteria were not met
and/or see below

TARGET COMPOUND IDENTIFICATION

Criteria:

1. Is Retention Times (RTs) of both of the surrogates and reported target compounds in each sample within the calculated RT Windows on both columns? Yes? or No?
2. Is the Tetrachloro-m-xylene (TCX) RT ± 0.05 minutes of the Mean RT (RT) determined from the initial calibration and Decachlorobiphenyl (DCB) within ± 0.10 minutes of the RT determined from the initial calibration? Yes? or No?
3. Is the Percent Difference (%D) for the detected mean concentrations of a pesticide target compound between the two Gas Chromatograph (GC) columns within the inclusive range of ± 25.0 %? Yes? or No?
4. When no analytes are identified in a sample; are the chromatograms from the analyses of the sample extract and the low-point standard of the initial calibration associated with those analyses on the same scaling factor? Yes? or No?
5. Does the chromatograms display the Single Component Pesticides (SCPs) detected in the sample and the largest peak of any multi-component analyte detected in the sample at less than full scale. Yes? or No?
6. If an extract is diluted; does the chromatogram display SCPs peaks between 10-100% of full scale, and multi-component analytes between 25-100% of full scale? Yes? or No?
7. For any sample; does the baseline of the chromatogram return to below 50% of full scale before the elution time of alpha-BHC, and also return to below 25% of full scale after the elution time of alpha-BHC and before the elution time of DCB? Yes? or No?
8. If a chromatogram is replotted electronically to meet these requirements; is the scaling factor used displayed on the chromatogram, and both the initial chromatogram and the replotted chromatogram submitted in the data package. Yes? or No?

Action:

- a. If the qualitative criteria for both columns were not met, all target compounds that are reported as detected should be considered non-detected.
- b. Use professional judgment to assign an appropriate quantitation limit using the following guidance:
 - i. If the detected target compound peak was sufficiently outside the pesticide RT Window, the reported values may be a false positive and should be replaced with the sample Contract Required Quantitation Limits (CRQL) value.

DATA REVIEW WORKSHEETS

- ii. If the detected target compound peak poses an interference with potential detection of another target peak, the reported value should be considered and qualified as unusable (R).
- c. If the data reviewer identifies a peak in both GC column analyses that falls within the appropriate RT Windows, but was reported as a non-detect, the compound may be a false negative. Use professional judgment to decide if the compound should be included.

Note: State in the Data Review Narrative all conclusions made regarding target compound identification.

- d. If the Toxaphene peak RT windows determined from the calibration overlap with SCPs or chromatographic interferences, use professional judgment to qualify the data.
- e. If target compounds were detected on both GC columns, and the Percent Difference between the two results is greater than 25.0%, consider the potential for coelution and use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, use professional judgment to determine how best to report, and if necessary, qualify the data according to these guidelines.
- f. If Toxaphene exhibits a marginal pattern-matching quality, use professional judgment to establish whether the differences are due to environmental "weathering" (i.e., degradation of the earlier eluting peaks relative to the later eluting peaks). If the presence of Toxaphene is strongly suggested, report results as presumptively present (N).

GAS CHROMATOGRAPH/MASS SPECTROMETER (GC/MS) CONFIRMATION

NOTE: This confirmation is not usually provided by the laboratory. In cases where it is provided, use professional judgment to determine if data qualified with "C" can be salvaged if it was previously qualified as unusable (R).

Action:

- a. If the quantitative criteria for both columns were met (≥ 5.0 ng/ μ L for SCPs and ≥ 125 ng/ μ L for Toxaphene), determine whether GC/MS confirmation was performed. If it was performed, qualify the data using the following guidance:
 - i. If GC/MS confirmation was not required because the quantitative criteria for both columns was not met, but it was still performed, use professional judgment when evaluating the data to decide whether the detect should be qualified with "C".
 - ii. If GC/MS confirmation was performed, but unsuccessful for a target compound detected by GC/ECD analysis, qualify those detects as "X".

DATA REVIEW WORKSHEETS

All criteria were met X
 Criteria were not met
 and/or see below

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC21036-3MS

Endrin ketone

RF = 0.848

$$\begin{aligned} [] &= (180.7 \times 10^6)(50)/(389.6 \times 10^6)(0.848) \\ &= 27.35 \text{ ppb} \quad \text{Ok} \end{aligned}$$

Action:

- If sample quantitation is different from the reported value, qualify result as unusable (R).
- When a sample is analyzed at more than one dilution, the lowest CRQLs are used unless a QC exceedance dictates the use of the higher CRQLs from the diluted sample.
- Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its corresponding value on the original reporting form and substituting the data from the diluted sample.
- Results between the MDL and CRQL should be qualified as estimated (J).
- Results less than the MDL should be reported at the CRQL and qualified (U). MDLs themselves are not reported.
- For non-aqueous samples, if the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table).

Percent Moisture Actions for Pesticide Analysis for Non-Aqueous Samples

Criteria	Action	
	Detected Associated Compounds	Non-detected Associated Compounds
% Moisture < 70.0	No qualification	
70.0 < % Moisture < 90.0	J	UJ
% Moisture > 90.0	J	R

DATA REVIEW WORKSHEETS

List samples which have $\leq 50\%$ solids

Note: If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.

Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

DATA REVIEW WORKSHEETS

All criteria were met N/A
 Criteria were not met
 and/or see below

FIELD DUPLICATE PRECISION

NOTE: In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples. Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. If large RPDs (> 50%) is observed, confirm identification of samples and note difference in the executive summary.

Sample IDs: - Matrix: -

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. MS/MSD % recoveries RPD used to assess precision. RPD within the required criteria of < 50 %.					

Actions:

a. Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

b. If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

- i. If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).
- ii. If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.
- iii. If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.
- iv. If both sample and duplicate results are not detected, no action is needed.

DATA REVIEW WORKSHEETS

OVERALL ASSESSMENT OF DATA

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data.

Note: The Contract Laboratory Program Project Officer (CLP PO) must be informed if any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

Overall assessment of the data: Results are valid; the data can be used for decision making purposes.